OLDHAM COUNTY ENVIRONMENTAL AUTHORITY
REGIONAL FACILITY PLAN

Prepared By:
Hagerty Consulting, LLC
July 2013

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REFERENCES

MSD/OCSD Regional Wastewater Facilities Plan
HDR Regional Facility Plan 2007
KIPDA Traffic Analysis Zone Population and Home Data
FIRM Maps
Kentucky State Data Center Correspondence
OCEA Annual Report 2011
USEPA National Water Quality Inventory Report to Congress

Acronyms

AO	Agreed Order
ADF	Average Daily Flow
BOD	Biochemical Oxygen Demand
CBOD	Carbonaceous Biochemical Oxygen Demand
cfm	Cubic Feet per Minute
CIP	Cast Iron Pipe
CSP	Concrete Sewer Pipe
CSO	Combined Sewer Overflow
DIP	Ductile Iron Pipe
DMR	Discharge Monitoring Report
DOC	Kentucky Department of Correction
DOW	Kentucky Division of Water
FEMA	Federal Emergency Management Agency
gpcd	Gallons per Capita per Day
gpd	Gallons per Day
gpm	Gallons per Minute
HCWQTC	Hite Creek Water Quality Treatment Center
hp	Horsepower
I/I	Inflow & Infiltration
Institute for Women	Kentucky Corrections Institute for Women
KDOW	Kentucky Division of Water
KPDES	Kentucky Pollution Discharge Elimination System
KSDC	Kentucky State Data Center
lbs/day	Pounds per Day
LUC	LaGrange Utility Commission
mg/L	Milligrams per Liter
MGD	Million Gallons per Day
MSD	Louisville and Jefferson County Metropolitan Sewer District
NGO	Non-Government Organizations
NRCS	National Resources Conservation Service
O&M	Operation and Maintenance
OCEA	Oldham County Environmental Authority (formerly OCSD)
OCSD	Oldham County Sewer District
psi	Pounds per square inch
PVC	Polyvinyl chloride pipe
RFP	Regional Facilities Plan
SDR	Standard Dimension Ratio

SSO	Sanitary Sewer Overflows
TDH	Total Dynamic Head
TSS	Total Suspended Solids
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
VCP	Vitrified Clay Pipe
WLA	Kentucky Division of Water, Waste Land Allocation Determination
WWTP	Wastewater Treatment Plant

Section 1 – Regional Facility Plan Summary

Introduction and Background

Oldham County is located adjacent to and northeast of Jefferson County. Oldham County has experienced significant growth in its residential and commercial population. The county has grown from a 1990 census population of 33,263 to a 2010 census population of 60,316. The lack of a sewer authority in the unincorporated areas prior to 1996, resulted in the construction of a large number of on-site septic tanks for residential and commercial buildings and construction in planned residential subdivisions of small package type wastewater treatment plants.

By 1996, when the Oldham County Environmental Authority was formed (prior to 2009 it was known as the Oldham County Sewer District), there were 29 permitted wastewater treatment facilities in Oldham County serving residential, institutional, municipal, industrial and commercial users. Most of these facilities were located in the Crestwood (seven), Buckner (seven), and Goshen (five) areas. Many of these plants were beyond their useful life, not well maintained, and polluting receiving streams. The mission given to OCEA has been to develop a regional, publicly owned and operated wastewater system that would improve water quality, improve environmental management, and eliminate overflows.

Since the formation of OCEA, many of the package treatment plants have been eliminated through consolidation into regional systems by OCEA and the city of Crestwood. There have been dramatic improvements in the operations of the collection system as well. OCEA has reduced overflows across the county; and permit violations have been dramatically reduced. It is OCEA's goal to transition to facilities that will consistently comply with regulatory requirements. A key to that goal is eliminating many existing package WWTPs from service and providing wastewater treatment with regional treatment plants.

OCEA's past accomplishments include:

- Implemented operational improvements to the existing treatment plants resulting in a significant reduction in KPDES permit exceedances.
- Eliminated chronic overflows, cleaned and inspected over eighty percent of the collection system, and completing approximately $1.5 million in system rehabilitation work to improve the integrity and reduce infiltration/inflow (I/I).
- Constructed the Ohio River Regional WWTP and eliminated the Trails End, Cardinal Harbor and Covered Bridge Farm WWTPs.
- Invested over $1M in improvements to the Kentucky State Reformatory WWTP processes and made significant improvements to O&M procedures. Completing construction on the necessary conveyance systems to eliminate the Buckner and Buckner Industrial Tract WWTPs.
- Constructed the necessary conveyance system improvements to eliminate the Green Valley Apartments WWTP.

- Completing the development of an affordable regionalization plan for the Crestwood and South Floyds Fork Service Areas that will allow OCEA to eliminate 6 of the eleven remaining OCEA package treatment plants.

- Took over management of the County's MS4 Program and quickly eliminated existing Division of Water (DOW) Notices of Violation (NOVs) related to illicit discharges, and implemented stormwater Minimum Control Measures (MCM).

OCEA's goal is to develop regional wastewater solutions for the people of Oldham County that can be implemented in a cost-effective and timely manner. The proposed solutions recommended in this Facility Plan will improve water quality in Oldham County by eliminating package plants and on-site disposal systems while adding capacity to support land use planning and development in Oldham County.

The existing treatment facilities operated by OCEA serve higher density development areas of the County. Sewer service in areas restricted to one acre and larger lots are predominately served by on-site disposal systems. There are several areas where on-site systems have been constructed that have soil types or depths typically classified as unsuitable for on-site disposal. Operating on-site systems in these areas may lead to groundwater or surface water pollution. Oldham County Health Department regulates the permitting and construction of these systems.

The Department for Environmental Protection (DEP) has initiated enforcement action against the utility and has banned new sewer connections to the Willow Creek, Orchard Grass, and Ash Avenue wastewater treatment plants. In meetings with the DEP, Division of Enforcement, they have established as a priority, the continued elimination of package type treatment plants that fail to consistently meet permit requirements. The highest priority treatment plants identified by the Division of Enforcement are the three plants mentioned above: Willow Creek, Orchard Grass, and Ash Avenue package treatment plants. These facilities are in OCEA's Crestwood and South Floyds Fork Service Areas.

As one of the fastest growing counties in the state, the use of package treatment plants and on-site systems is undesirable. Regionalizing the sewer infrastructure will provide the infrastructure necessary to eliminate the need to rely on these technologies and lead to improved water quality and encourage future growth.

Purpose of the Plan

State regulations require all wastewater agencies to submit a Regional Facilities Plan or Asset Inventory Report every ten years; or when an agency is planning on expanding the existing wastewater treatment capacity by thirty percent or building a new facility/discharge. These requirements are contained in 401 KAR 5:006. This Facilities Plan will evaluate and establish a plan for wastewater service, comply with 401 KAR 5:006, and enable OCEA to meet DEP requirements.

The scope and purpose of this Regional Facility Plan is to:

- Develop a comprehensive plan for serving Oldham County's needs in a cost-effective and environmentally sound manner through the planning period. The 20-year Regional Facilities Plan will be developed in accordance with the regulation and Division of Water guidance document, *Regional Facility Plan Guidance, 2010.*
- Plan the replacement and decommissioning of existing failing package wastewater treatment plants.
- Fulfill a request from the Kentucky Department of Corrections to identify opportunities to provide regional solutions and treatment capacity for the Kentucky Correctional Institute for Women's Facility (Institute for Women) in the South Floyds Fork Service Area.
- Document input received during public hearings required by DOW regulations.
- Describe OCEA's recommended implementation and funding plan for the selected alternatives and present the estimated revenue and user fee requirements necessary to support implementation.
- Document the completion of the required environmental, archeological, and historic preservation cross cutter agency review requests.

Recommended Alternative

The integrated system alternative (South Floyd Fork Service Area Alternative 4, New Regional WWTP) is the recommended alternative for the service areas. Construction of a new Regional Treatment Plant to serve both the Crestwood and South Floyd Fork Service Areas will be constructed in the vicinity of Hite Creek with a regional collection system interconnecting the two service areas to the new Regional Treatment Facility.

The benefits of this recommended alternative are:

- Lowest cost solution for providing wastewater services to the Crestwood and South Floyds Fork Service Areas;
- Provides infrastructure needed to eliminate all existing package treatment plants in the service areas;
- Provides sewage conveyance and treatment capacity needed to end existing sewer connection moratoriums;
- Increases OCEA's customer base by giving existing residents, commercial facilities that have septic systems and the Institute for Women access to a regional system; and
- Removes several outfalls to the Floyds Fork Watershed from wastewater collection and treatment.

Cost of Proposed Plan

A multi-phased approach is recommended to complete the regional system over a 5-year period. Construction will require approximately $17 million in system investments, segmented into four phases for implementation:

Phase 1 – $ 11.6 million
Phase 2 – $ 4.7million
Phase 3 – $ 0.5 million
Phase 4 – $ 2.25 million

Each phase is shown on Figure 1-1 and is described in Section 10 of this report.

Planning Agency Commitments to Implement Plan

OCEA has the authority to prepare and implement the recommended projects within the planning area. DOW construction and environmental permits must be secured prior to construction. To provide wastewater service to the Institute for Women facility, a resolution will be developed by the Shelby County Fiscal Court to approve OCEA providing service within the county's boundary; with a service agreement being approved by the Kentucky Division of Corrections and the Kentucky Attorney General.

Schedule of Implementation for Recommended Projects

As previously discussed, the recommended program for the Regional Facilities Plan will be implemented in at least four phases with the schedule being dependent upon property/easement acquisition, completion of interlocal agreements, regulatory permit approvals, securing funding/financing approvals, etc.. The proposed schedule for each of the phased recommended projects is as follows:

Recommended Project	Estimated Completion Date
Phase 1 - Willow Creek/Orchard Grass Elimination	July 2016
Phase 2 – Ash Avenue / Institute for Women Elimination	July 2017
Phase 3 – Cherry Wood Apartments Elimination	December 2017
Phase 4 – Country Village Elimination	To Be Determined

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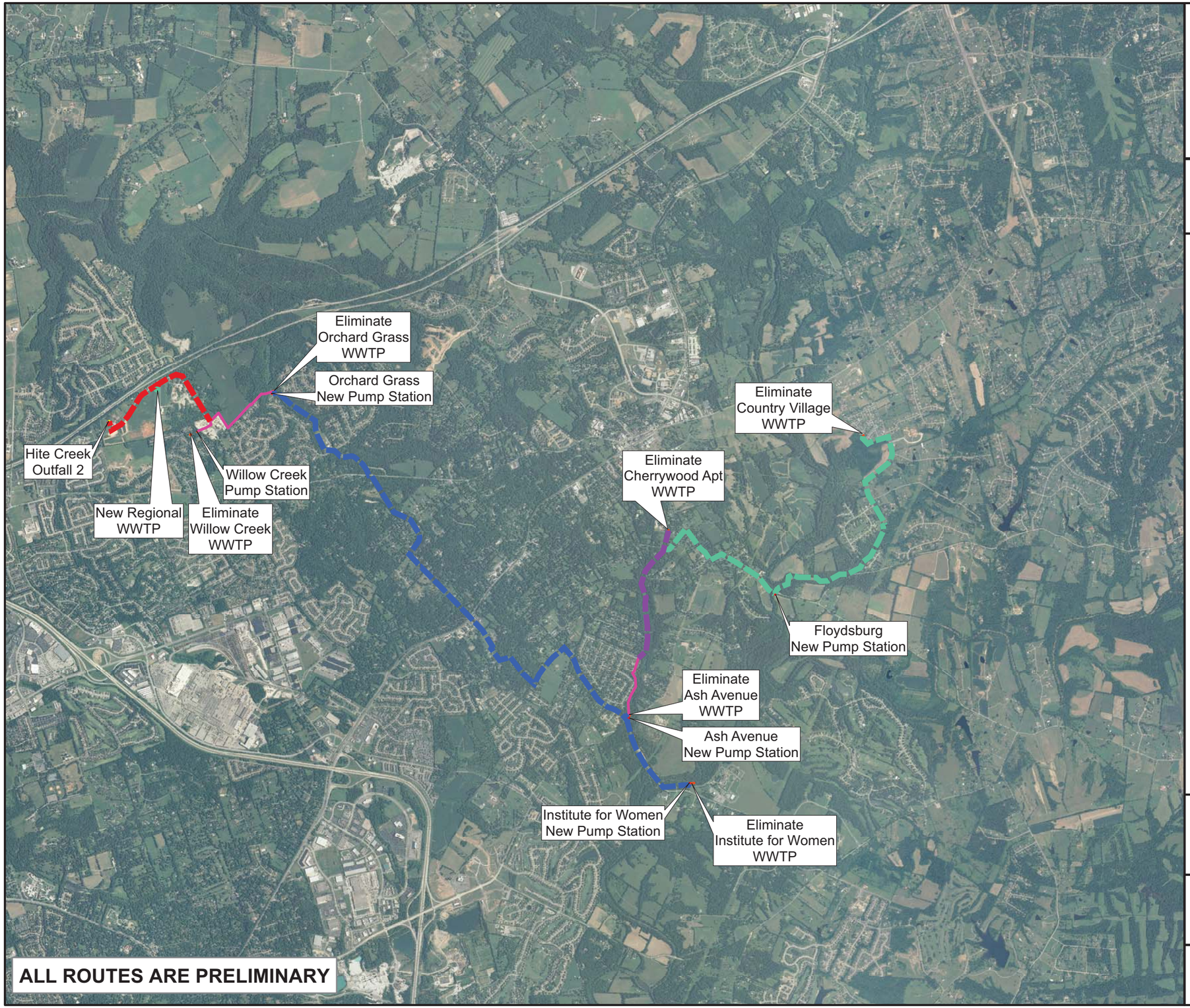
Regional Wastewater Facility Plan

July 2013



Legend

- New Sewer Main Phase 1
- New Sewer Main Phase 2
- New Sewer Main Phase 3
- New Sewer Main Phase 4
- Hite Creek Outfall Sewer Main
- Existing Sewer Mains
- Crestwood New Regional WWTP
- Hite Creek New Outfall 2
- Orchard Grass Pump Station
- Ash Ave Pump Station
- Institute for Women Pump Station
- Floydsburg Pump Station
- WWTPs

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Figure 1-1
Construction of a
New Orchard Grass Regional WWTP

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Section 2 - Statement of Purpose and Need

Purpose and Scope of Report

The purpose of the Regional Facilities Plan is to provide a plan for providing wastewater conveyance, and treatment for the planning area for the 20-year planning period. This is accomplished through a study of existing treatment plants, determining capacity requirements, evaluating future conditions, and taking into consideration costs, regionalization, environmental regulations, public health, reliability, and service to sewered and unsewered areas. Objectives of the plan include:

1. Update population and flow projections.
2. Provide solutions that have the flexibility to provide service to existing septic tank areas.
3. Identify regional solutions that eliminate temporary/package type treatment plants.
4. Identify alternatives that allow the Institute for Women to become part of the regional wastewater collection and treatment system.
5. Establish effluent treatment requirements that are consistent with state regulations.
6. Identify alternatives including whether utilization of existing or planned future treatment capacity within MSD's system could be an alternative.
7. Conduct an initial screening of alternatives and generate a short list for evaluating alternatives that can be implemented by OCEA in compliance with environmental regulations and OCEA's responsibilities.
8. Evaluate the short list of alternatives and recommend the most favorable alternative based upon cost and non-cost factors.
9. Prepare a preliminary implementation plan to guide phasing, identify funding needs and establish a preliminary schedule for implementing the recommended alternative.

Existing Planning Area

Oldham County has a total of 126,008 acres. Of this total, 115,756 acres are within the OCEA Planning Area; the remainder being in the LaGrange Service Area. Oldham County is situated within three watersheds: Ohio River watershed, Harrods Creek watershed, and Floyds Fork watershed. Each has documented water quality issues. The three watershed areas are shown on Figure 2-1.

Ohio River Watershed

This watershed has a total area of 35,741 acres and includes the cities of Goshen and Westport. Subwatersheds within the area include: Bull Creek, Eighteen Mile Creek, Garret Branch, Sycamore Run, Caney Fork, Little Huckleberry Creek, Morris Branch, Pattons Branch, Organ Creek, Pond Creek, and Taylor Creek.

from OCSD Regional Wastewater Facilities Plan, 2007

PC
PC.1
PC.1.1
PC.1.1.1
PC.1.1.2
OH.3
EC.1.1.1
EC.1
EC.1.1
EC.1.1.2
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OH.2
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ALL ROUTES ARE PRELIMINARY

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Regional Wastewater Facility Plan

July 2013

LEGEND

- Subareas

Watersheds

- Floyds Fork
- Harrods Creek
- Ohio River

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Figure 2-1
Watersheds and Subareas

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Harrods Creek Watershed

This watershed covers 52,229 acres and includes the communities of Crestwood, Pewee Valley, Orchard Grass, and Brownsboro, as well as portions of Buckner and LaGrange. Subwatersheds include: Darby Creek, South Fork of Darby Creek, Sinking Fork, Hite Creek, Berry Creek, Ash Run, Brush Creek, Cedar Creek, North Fork of Cedar Creek, and South Fork of Cedar Creek.

Floyds Fork Watershed

The Floyds Fork watershed has a total area of 37,978 acres. It includes the cities of Centerfield and Ballardsville, plus portions of LaGrange and Buckner. Subwatersheds include: Ashers Run, Currys Fork, North Currys Fork, South Currys Fork, Lick Fork, Junkins Run, Gathright Branch, North Fork of Floyds Fork, and East Fork of Floyds Fork.

Prior to 1984, the only methods for wastewater treatment in the county were private package treatment plants serving small communities and on-site systems. The primary on-site systems were septic tanks and leach fields. In 1984, a municipal wastewater treatment plant was built to serve the City of LaGrange. Sewers now serve residences in areas near Buckner, Goshen, Crestwood, Willow Creek, Orchard Grass and Ash Avenue. While sewerage systems do exist in the county, there are significant areas served by individual on-site systems. The *MSD/OCSD Facilities Plan* submitted in 2002 provided a map of areas that have a history of failing or periodic malfunctioning septic tank systems. The construction, inspection and permitting of on-site treatment system is under the jurisdiction of Oldham County Health Department.

Enforcement Considerations

Agreed Order Discussions

OCEA is in discussions with the Kentucky Department for Environmental Protection (DEP), Division of Enforcement on an Agreed Order to address Notices of Violation (NOVs) issued to the OCEA. The Division of Enforcement has identified the Willow Creek, Orchard Grass, and Ash Avenue wastewater treatment plants as facilities posing the greatest compliance concerns.

Sewer Connection Moratorium

The Willow Creek, Ash Avenue and Orchard Grass treatment plants are unable to connect new customers due to lack of capacity as evidenced by the sewer sanctions issued by the DEP Division of Enforcement. This moratorium has prevented the construction of new residential and commercial building within the service areas. The alternatives developed in this Plan will be evaluated based on providing adequate treatment capacity to meet existing system capacity requirements and capacity to meet the 20-year planning horizon projections.

Section 3 – Physical Characteristics of the Planning Area

Introduction

In this section, the planning and service area boundaries are presented and key topographic, geographic, and natural or man-made features are identified.

Planning Area

A Facilities Plan for a portion of Oldham County (basically the southwest corner of the county) was originally developed in 1976 by Oldham County Water District No.1. Many changes have taken place since that time. The county has experienced rapid growth and those responsible for providing sewerage service have evolved as well through Oldham County Sewer District (OCSD) to what is now known as Oldham County Environmental Authority. For these reasons, over the years, several updates have been completed for specific areas within the county including joint planning ventures with Louisville Metropolitan Sewer District (MSD). The most recent approved planning document prepared for Oldham County was a joint venture by MSD and OCSD in 2002 and an update that was submitted in 2007. This Plan expanded the Planning Area within Oldham County to the north and west to the Ohio River and the intersection of U.S. 42 and HWY 393. Also during that timeframe, OCSD took on the Buckner area and consolidated treatment at the Kentucky State Reformatory Wastewater Treatment Plant to serve that rapidly developing area. This effectively expanded the OCSD Planning Area to LaGrange.

In 2007 OCSD continued their planning efforts by developing a Facilities Plan which proposed the Planning Area being the entire country with the exception of the LaGrange Planning Area. Although this document never received final approval by the Division of Water (DOW), OCEA has continued to construct and implement projects that have consolidated sewer service into three regional systems. Four service areas have been identified within the Planning Area and are shown in Figure 3-1 and described below:

- **Kentucky State Reformatory (KSR) Service Area** – The KSR Service Area is the largest in the Service Area and encompasses the City of Buckner and surrounds the LaGrange Utility Commission (LUC) Service Area. It has the largest population and is expected to experience the most significant growth over the planning period. The KSR WWTP provides treatment for most of the customers in this area.

- **Crestwood Service Area** -This Service Area encompasses the communities of Crestwood, Orchard Grass, Willow Creek, Briar Hill and Park Lakes. A portion of the City of Pewee Valley and Crestwood are also within the Crestwood Service Area. This area includes the Willow Creek and Orchard Grass WWTPs and areas where wastewater treatment is accomplished by on-site treatment systems (septic tanks or other methods). Many recommendations made in the *MSD/OCSD Regional Wastewater Facilities Plan (MSD/OCSD Plan)* in 2002 have been implemented.

- **Ohio River Service Area** -This service area encompasses the city of Goshen and River Bluff and surrounding neighborhoods. Wastewater treatment is provided by OCEA's Ohio River WWTP, privately-owned River Bluff and Paramount package treatment facilities, and one school plant (Liberty Elementary). Projects in this service area have proceeded as recommended by the *MSD/OCSD Plan*.

- **South Floyds Fork Service Area** – This Service Area is located in the south central portion of the county and has the largest number of individual on-site systems. Wastewater treatment is provided by the Ash Avenue WWTP, Country Village WWTP and privately owned Cherry Hill Apartment and Friendship Manor package treatment facilities.

Most of the county that is not included in one of the service areas is very rural in nature and wastewater treatment is provided using individual on-site systems. The Planning and Service Areas addressed in this Facilities Plan are shown in Figure 3-1. Additional wastewater treatment may be required in these areas to provide sewer service through the 20-year planning horizon.

Land Use

The Oldham County Planning and Development Service is responsible for land use planning in the county. Figure 3-2 present the future land uses in the planning area. Existing and future land use in the Planning Area is characterized by large residential areas bordered by agricultural, rural and conservation areas. There are small pockets of industrial, commercial, and institutional land uses in the planning areas. Development within this will provide direction in the construction of future projects during the planning period.

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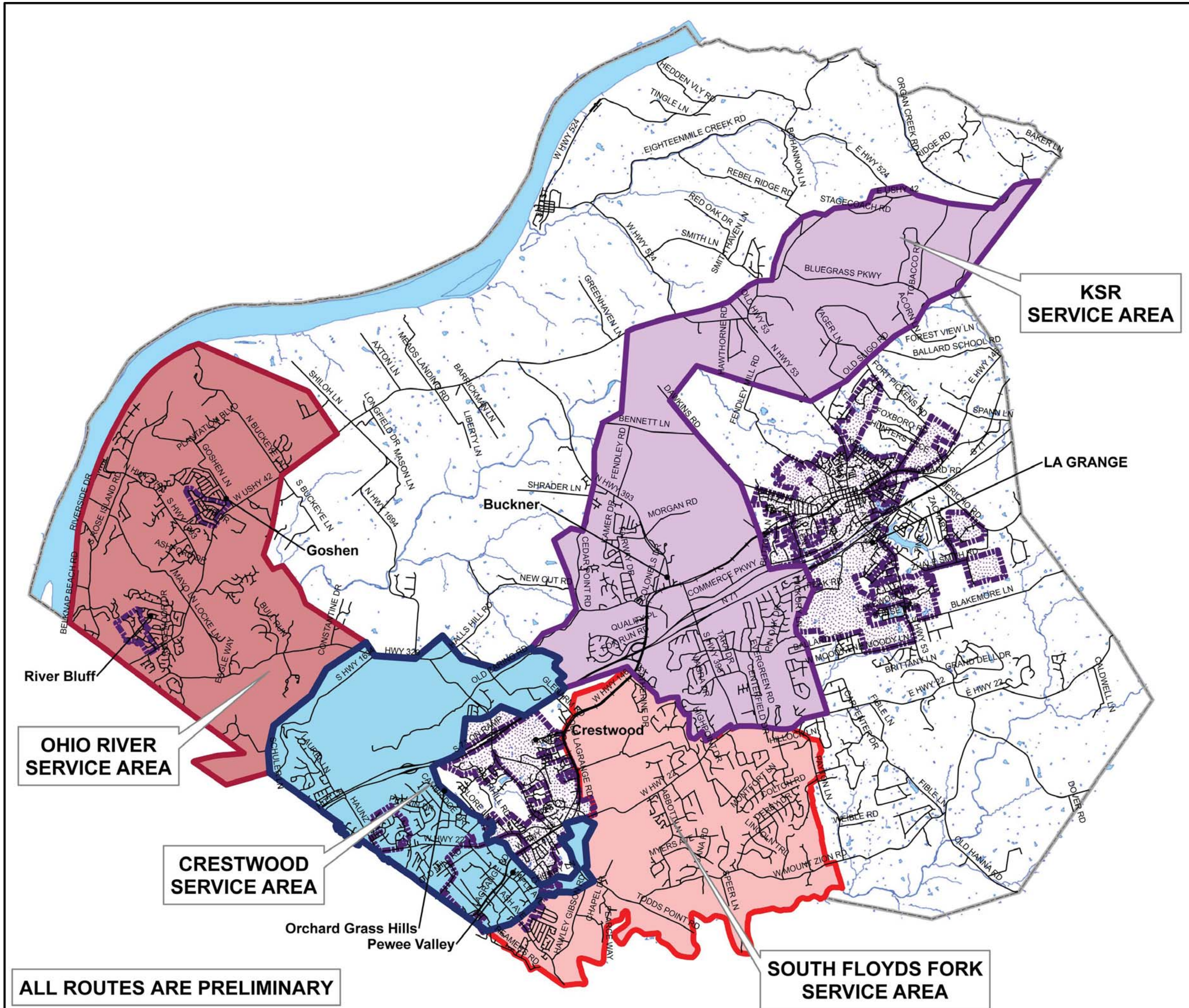

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Regional Wastewater Facility Plan

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Legend

- Crestwood Planning Area line
- KSR Planning Area
- Ohio River Planning Area
- Railroad
- Streets
- Cities Outline
- KSR Planning Area
- Ohio River Planning Area
- Crestwood Planning Area Poly
- South Floyds Fork Planning Area
- South Floyds Fork Planning Area Poly
- Cities
- Oldham County
- Water

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Figure 3-1
OCEA Service Areas

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Regional Wastewater Facility Plan

July 2013

Future Land Use

- Ag/Rural
- Ag/Single Family
- Conservation
- Attached/Multi-Family
- Commercial
- Commercial/Industrial
- Industrial
- Institutional
- Recreation/Open Space
- Single Family
- Single Family - Future Subdivision
- Single Family - City
- ROW

ALL ROUTES ARE PRELIMINARY

Legend

Oldham County

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Figure 3-2
County Future Land Use Map

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Section 4 – Socioeconomic Characteristics of the Planning Area

Historical Population Data

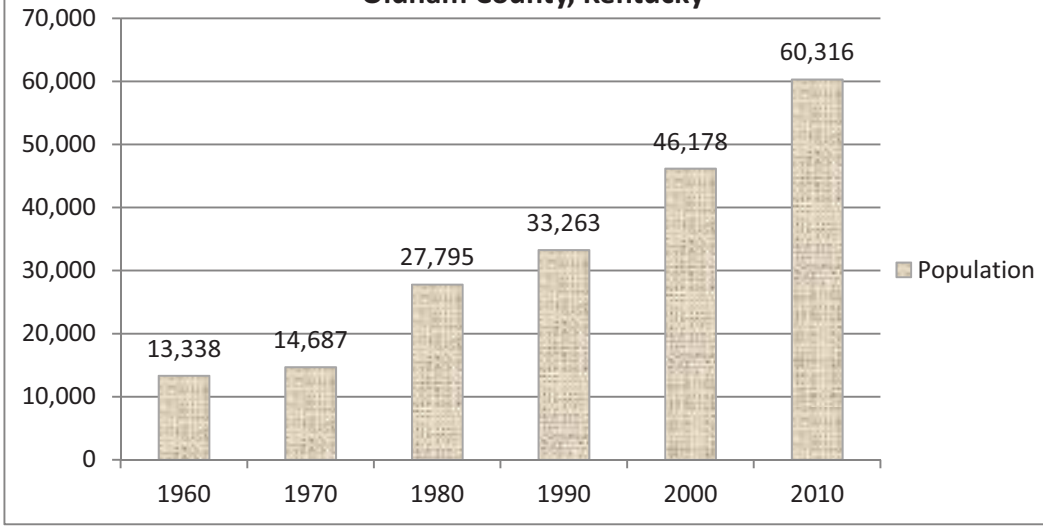
Oldham County has been one of the fastest growing counties in the Commonwealth of Kentucky since the 1970s. During the five decade period between 1960 and 2010, Oldham County saw a growth of over 350 percent, an increase in population from 13,338 persons to 60,316 persons. Table 4-1 and Figure 4-1 present this historical population data.

Table 4-1
Population and Percent Growth
Oldham County, Kentucky

	Population	Percent Change
1960	13,338	
1970	14,687	10.11%
1980	27,795	89.25%
1990	33,263	19.67%
2000	46,178	38.83%
2010	60,316	30.62%

Source: United States Census Bureau

Figure 4-1
Historic Population
Oldham County, Kentucky



Oldham County contains six incorporated cities: Crestwood, Goshen, LaGrange, Orchard Grass Hills, Pewee Valley, and River Bluff. All of these cities, with the exception of LaGrange, are within the OCEA Planning Area. Table 4-2 presents historical population data for these cities.

Table 4-2
Population of Incorporated Cities
Based on 2010 Census Data
Oldham County, Kentucky

	Crestwood	Goshen	LaGrange	Orchard Grass	Pewee Valley	River Bluff
1960	*	*	2,168	*	881	*
% change						
1970	*	*	1,713	*	950	*
% change			-21.0%		7.8%	
1980	531	*	2,971	1,047	982	*
% change			73.4%		3.4%	
1990	1,435	*	3,853	1,068	1,283	452
% change	170.2%		29.7%	2.0%	30.7%	
2000	1,999	907	5,676	1,031	1,436	402
% change	39.3%		47.3%	-3.5%	11.9%	-11.1%
2010	4,531	909	8,082	1,595	1,456	403
% change	126.7%	0.2%	42.4%	54.7%	1.4%	0.2%
Pop./House	2.78	2.99	2.65	3.14	2.71	2.70

By utilizing 2010 census block data from the U.S. Census Bureau, the population and number of households can be reasonably estimated for each of the service area, as shown in Table 4-3.

Table 4-3
Population and Households in Service Areas
Based on 2010 Census Data
Oldham County, Kentucky

Service Area	Population	Households
South Floyds Fork	10,310	3,520
KY State Reformatory	15,580	5,880
Ohio River	9,670	3,400
Crestwood	9,950	3,580
Remainder of Planning Area	7,380	2,570

Population Projections

Based on information obtained from the Kentucky State Data Center, the Oldham County population is projected to continue to grow over the next twenty years. These data project an increase in population of 11.6% by 2015, 21.7% from 2015 to 2025, and 17.2% from 2025 to 2035.

Table 4-4
Population Projections Through 2035
Oldham County, Kentucky

	2015	2020	2025	2030	2035
Oldham Co.	67,412	74,990	82,306	89,639	96,668
LaGrange	9,134	10,274	11,399	12,575	13,534
Planning Area	58,278	64,716	70,907	77,064	83,134
Crestwood	5,056	5,624	6,173	6,723	7,250
Goshen	1,011	1,125	1,235	1,345	1,450
Orchard Grass	1,786	1,987	2,181	2,375	2,562
Pewee Valley	1,618	1,800	1,975	2,151	2,320
River Bluff	450	501	550	599	646

Socioeconomic Conditions

The initial capital costs and annual operation and maintenance costs of wastewater collection and treatment improvements proposed in any planning document must be paid by the users of the system.

According to the U.S. Department of Labor, Bureau of Labor Statistics, unemployment in Oldham County is well below the current state average of 7.7% at 6.6%. Approximately 70 percent of the county is employed in management, business, science, art, sales, and office occupations. Median earnings in Oldham County are now at an average $41,916, above the state average of $29,730 as reported by the U.S. Census Bureau.

Much of the county remains agricultural in nature. Although the number of farms has fluctuated within a narrow range between 450 and 500, the number of acres farmed has decreased. This can be seen in the data maintained by the U.S. Department of Agriculture, National Agricultural Statistics Service as the average farm size is now approximately 130 acres versus 202 in 1978.

Industrial and Commercial User Projection

There is a limited area of commercial, institutional and industrial zoning in the planning area and the new flows expected from these developments should not be significant in volume. Oldham County School Board was planning the development of a new K through 12 campus in the Crestwood Service Area. The flow for this campus is estimated at 57,000 gpd. An interlocal agreement with the City of Crestwood and MSD has been approved and the flow generated by the new facility will be treated at MSD's Hite Creek WQTC. However this project has been cancelled indefinitely and the new sewer capacity has not been included in the future flow projections for the Crestwood Service Area.

Economic Impact on the Community

OCEA is under a sewer connection moratorium that prohibits new connections to the existing treatment plants in the Crestwood and South Floyds Fork Service Areas. The sewer moratorium prevents growth in these areas economy. Constructing new treatment capacity and developing a regionalized sewer system will allow new development to occur and expand OCEA's customer base. Constructing the recommended plan will also allow OCEA to avoid future fines from violations of the Clean Water Act and Kentucky statutes and regulations.

Section 5 – Existing Environment in the Planning Area

Introduction

The Oldham County Planning Area has a diversity of land uses, from small industrial/commercial facilities to agricultural land/conservation areas to low and high-density housing developments. For OCEA, this presents many challenges for construction of a regional wastewater system. The area topography and geology also presents significant challenges including the extreme change in topographic elevation, significant rock outcrops and the limited assimilation capacity of area waterways.

Physiography

Oldham County lies in the Outer Bluegrass physiographic region of Kentucky and is underlain by limestone and bordered by the Ohio River in the north and knobs in the south, west and east. The Bluegrass Region is characterized by pastureland, corn and soybean production.

Topography

The county's elevation benchmarks range from 430 feet at the Ohio River, to nearly 900 feet just northeast of the intersection of U.S. 42 and Eighteen Mile Road. Topographic characteristics contrast from steeper slopes adjacent to the Ohio River, major streams and creeks, to rolling hills and some level land. Major stream slopes, running generally east to west, are reported as moderate to nearly flat. Rocky outcroppings are dispersed liberally throughout the County. A USGS Topographic Map of the planning area is shown on Figure 5-1.

Geology

Oldham County is in the Outer Bluegrass physiographic region. Most of the exposed rocks in the higher elevations are limestone or calcareous shale. A layer of loess (fine sand), twenty to forty inches thick, covers most of the ridge tops in the northern half of the county. The Louisville Limestone Formation underlies soils in this area. Lower elevations lack the loess mantle and are commonly underlain with soft calcareous shales and siltstones which weather rapidly when exposed. Some of the broader ridge tops in the southern half of the county have a twenty to forty inch loess mantle over the residuum. Narrow bands of deep mixed alluvial soils follow the courses of the Ohio River, Floyds Fork, Harrods Creek, and their tributaries.

Bedrock can pose sewer construction problems in the planning area. While contributing to higher costs, blasting and other construction techniques will still allow sewer construction in areas of shallow bedrock. A soils map of the planning area can be found in Figure 5-2.

Soils

Oldham County's land is reported to be its most important natural resource. The character and quality of the soil are prime feature components of the land. As shown in Figure 5-2 the seven soil associations in the County are:

- Wheeling-Huntington
- Beasley-Caneyville

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July 2013

Legend

- Oldham County
- Water

N

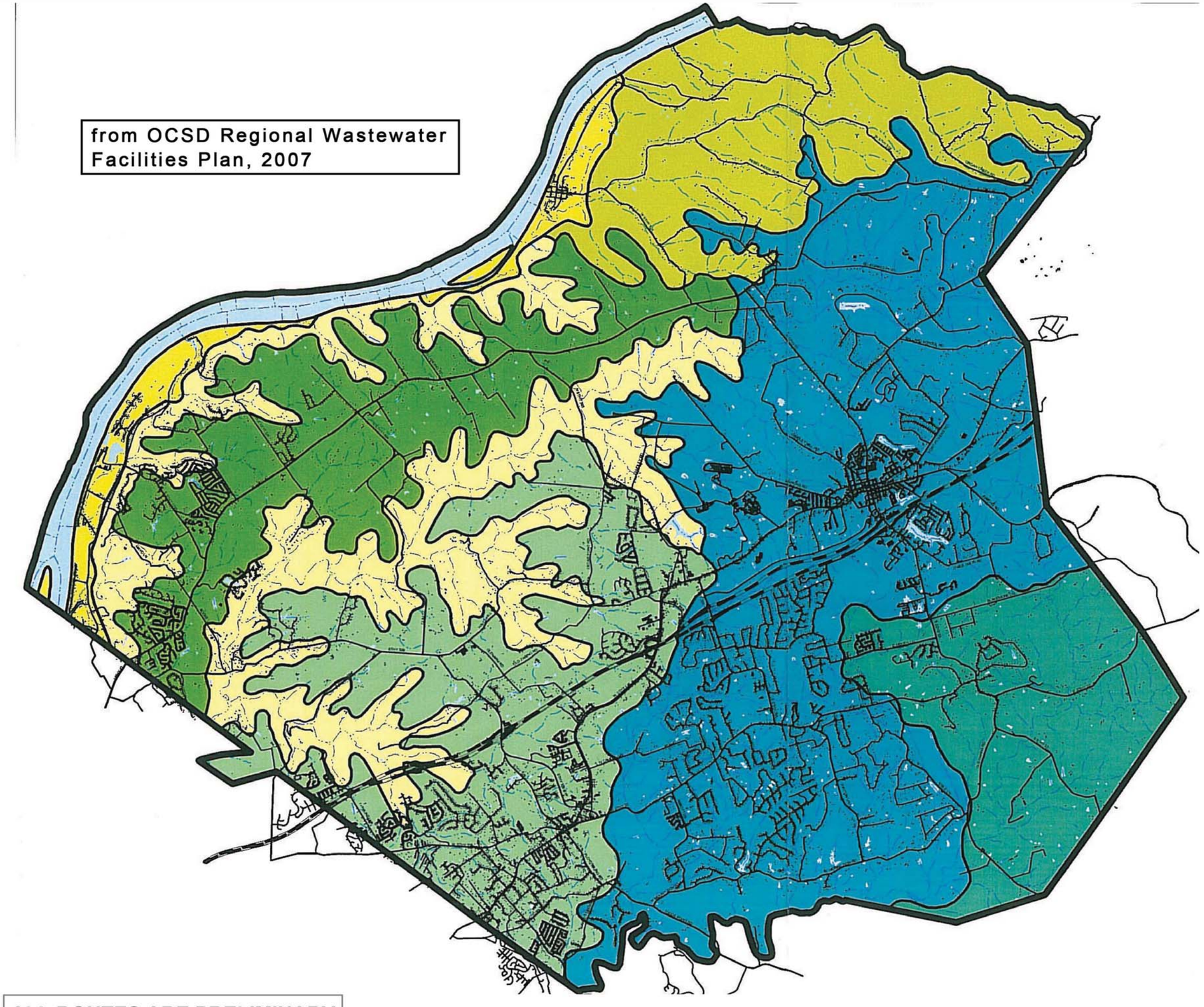
0 1,800 3,600 7,200 10,800 14,400 18,000

Feet

ALL ROUTES ARE PRELIMINARY

Figure 5-1
USGS Topographic Map

from OCSD Regional Wastewater Facilities Plan, 2007



ALL ROUTES ARE PRELIMINARY

OCEA

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July 2013

LEGEND

General Soil Association

- Wheeling-Huntington
- Beasley-Caneyville
- Crider-Nicholson
- Crider-Beasley
- Beasley-Cynthiana-Faywood
- Beasley-Nicholson
- Lowell-Faywood-Beasley

N

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Feet

Oldham County Environmental Authority

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Figure 5-2
Soil Map

- Crider-Nicholson
- Crider-Beasley
- Beasley-Cynthiana-Faywood
- Beasley-Nicholson
- Lowell-Fayood-Beasley

Few areas of Oldham County are totally unsuited for urban development. Large sections of the Beasley-Caneyville and the Beasley-Cynthiana-Faywood soil associations are so steep and shallow to bedrock that urban development would be extremely costly. Flooding is a problem in the lower lying Wheeling-Huntington association.

Areas of the county best suited for urban development are those with Crider-Nicholson and Crider-Beasley soil associations and the well-drained stream terrace portions of the Wheeling-Huntington association. Areas having the Lowell-Faywood-Beasley and Beasley-Nicholson associations have soils that are generally limited for septic tanks due to subsoils with slow permeability.

The Wheeling-Huntington association is primarily located along the Ohio River. Nearly level to strongly sloping Wheeling soils are on stream terraces above the Huntington soils, which are on floodplains. Loamy Wheeling and Huntington soils are each both deep and well drained. This association has a good potential for farming.

Beasley-Caneyville association soils are located just inland from the Ohio River and in the southern portion of this area along Harrods Creek and HWY 329. These soils have formed in a clayey residuum from limestone, sandstone, and siltstone. Beasley soils are deep, well drained, and have clayey subsoil. Caneyville soils are moderately deep to hard limestone bedrock, are well drained, and have a predominantly clay subsoil. This association has a very low potential for farming and urban use, while having a high potential for woodland wildlife habitat.

Crider-Nicholson is the predominant soil association centered on U.S. 42. Scattered throughout this association are small karst areas with sinkholes and underground drains. Crider soils are deep, well drained, and have loamy subsoil. Nicholson soils are moderately well drained and have loamy subsoil. A slowly permeable fragipan is in the lower part of the subsoil. This association has high potential for farming, and generally has high potential for urban development, except for the soils that have a fragipan, which are not suitable soils for septic tank absorption fields.

There are two main soil associations between Currys Fork and HWY 146 at I-71 running roughly parallel to Currys Fork south to the County line. Crider-Beasley association soils are found in the western portion of this area. Scattered throughout this association are small areas having karst relief with sinkholes and underground drains. Both soils are deep and well drained. This soil association is subject to erosion, but has a high potential for farming and urban development, except where clayey subsoil limits septic tank absorption.

Beasley-Nicholson association soils occupy 37% of the County. Sloping, to strongly sloping, Beasley soils are mostly on hillsides below gently sloping Nicholson soils on moderately broad ridgetops. Beasley soils are deep, well drained, and have clayey subsoil. Nicholson soils are moderately well drained. They are loamy in the upper part of the subsoil; the lower part of the subsoil is a slowly permeable fragipan. These soils exhibit medium potential for farming and urban development.

The fragipans and clayey subsoils are deleterious to proper operation of septic tank soil absorption fields. The failure of septic systems to percolate properly ultimately leads to contamination of the groundwater and streams within the affected areas. Areas where poor soils may contribute to septic system problems include: Crystal Lake, LaGrange Acres, Borowick Farm, Echo Valley, Greenbriar, Pewee Valley, Clorecrest, and Old Taylor Place.

Hydrology

Oldham County has three well-defined drainage watersheds. These are the Ohio River watershed, a major portion of the Harrods Creek watershed, and a small part of the Floyds Fork watershed. The Ohio River watershed drains directly to the Ohio River. In the central portion of the County, a corridor up to five miles wide is drained by Harrods Creek, whose watershed extends from Henry County in the northeast, to Jefferson County in the southwest. Stream slopes are moderate in the upper reaches of Harrods Creek gradually flattening as the creek flows downstream, until they become virtually nonexistent in the lower reaches. The nature of the watershed reflects urban impact adjacent to Jefferson County in the south, where development has occurred. A rural, agricultural nature defines the upper reaches of the watershed. Major tributaries to Harrods Creek within Oldham County are Ashers Run, Brush Creek, Cedar Creek, Darby Creek, and the South Fork of Harrods Creek.

The southern extent of the County is part of the multi-county Floyds Fork watershed, which drains into the Salt River in Bullitt County. Southern Oldham County, which drains into Floyds Fork's upper tributaries, contains the City of LaGrange and the communities of Crestwood and Pewee Valley, as well as other smaller communities and subdivisions developed adjacent to Jefferson County. The remainder of the watershed is mostly rural and agricultural in nature. The major tributary to Floyds Fork, draining the southern portion of Oldham County, is Currys Fork with its north and south forks. Stream slopes for Currys Fork and Floyds Fork in Oldham County are moderate.

Rainfall in Oldham County is fairly heavy throughout the year, with a slight increase during spring. Snowfall is present most winters, but snow cover usually lasts only a few days. Almost half of the total annual precipitation typically falls between April and September, with the heaviest of storms developing in the summer.

Water Quality in Streams and Lakes in the Planning Area

The National Water Quality Inventory Report to Congress (305(b) report) is the primary vehicle for informing Congress and the public about general water quality conditions in the United States. This document characterizes water quality, identifies widespread problems of national significance, and describes various programs implemented to restore and protect waters. Figure 5-3 shows the designation of impaired waterbodies in Oldham County.

Section 303(d) of the Clean Water Act requires all states, territories, and authorized tribes to develop lists of impaired waters. These are waters that are too polluted or otherwise degraded to meet established water quality standards. This law requires the jurisdictions to establish priority rankings for waters on the list and develop Total Maximum Daily Loads (TMDLs) for these waters. A TMDL is a calculation of the maximum amount of a pollutant that a water body can receive and still safely meet water quality standards. A TMDL Assessment of Floyds Fork Creek is currently being developed and is expected to be completed in the fall of 2014.

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TRIMBLE

JEFFERSON

ALL ROUTES ARE PRELIMINARY

Legend

- Sewer Treatment Facilities
- TMDL
- Crestwood Planning Area
- South Floyds Fork Planning Area

PCR

- Not Supporting
- Partially Supporting

N

0 1,800 3,600 7,200 10,800 14,400 18,000

Feet

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Figure 5-3
Impaired Waters

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The primary streams in Oldham County are Floyds Fork, Harrods Creek, and Curry's Fork. Oldham County has three stream segments and one lake listed on the 305(b) report to Congress. OCEA does not have an outfall that directly discharges into these impaired stream segments or lake. The Curry's Fork impaired section does have one of the highest densities of septic tanks in the County.

OCEA's Willow Creek and Orchard Grass WWTPs in the Crestwood Service Area flow into the headwater of Sleepy Hollow Lake. DOW has indicated these outfalls will need to be eliminated and no discharge to Sleepy Hollow Lake will be permitted. A Wasteload Allocation for a new discharge to Hite Creek in the Crestwood Service Area has been approved by DOW and is the basis of system alternatives.

Wetlands

Oldham County has many potential small or intermittent wetlands. The U.S. Department of Interior, Fish and Wildlife Service maintains a detailed record of wetland locations in Oldham County. Construction in wetlands should be avoided and an environmental review will be conducted of the sewer alignments and proposed treatment plant sites to identify and protect exiting wetland features.

100-Year Floodplain

Three distinct watersheds dissect Oldham County to serve drainage needs within the planning area. The Ohio River Watershed covers that portion of the countywide planning area from HWY 42 north to the river. The Harrods Creek watershed encompasses the area between HWYs 42 and 146. The Floyds Fork watershed drains the remainder of the county south of HWY146. The effectiveness of each of these watersheds to adequately collect and drain stormwater runoff and prevent flooding is dependent on numerous factors ranging from localized rainfall intensity and duration to the pool levels controlled by the Corps of Engineers (COE) through the series of locks and dams on the Ohio River. Based on flood insurance maps prepared by the Federal Emergency Management Agency (FEMA), the 100-year floodplain for the countywide planning area is illustrated in Figure 5-4.

A number of areas within the County are located in floodplains due to elevation in proximity to the Ohio River and numerous streams that cross the County. The 100-year floodplain encompasses the Ohio River boundary to approximately 800 to 1,300 feet inland from the riverbank, from Pond Creek upstream to Mayo Lane, and approximately 4,000 feet up Little Huckleberry Creek. The floodplain along Harrods Creek is 100 to 500 feet wide, with floodplains along tributaries reported as 80 to 130 feet wide. The floodplains associated with Curry's Fork vary from 200 to 400 feet and Floyds Fork from 100 to 200 feet wide, near the Jefferson County line. Flood prone areas and major drainage watersheds of Oldham County are shown in Figure 5-4.

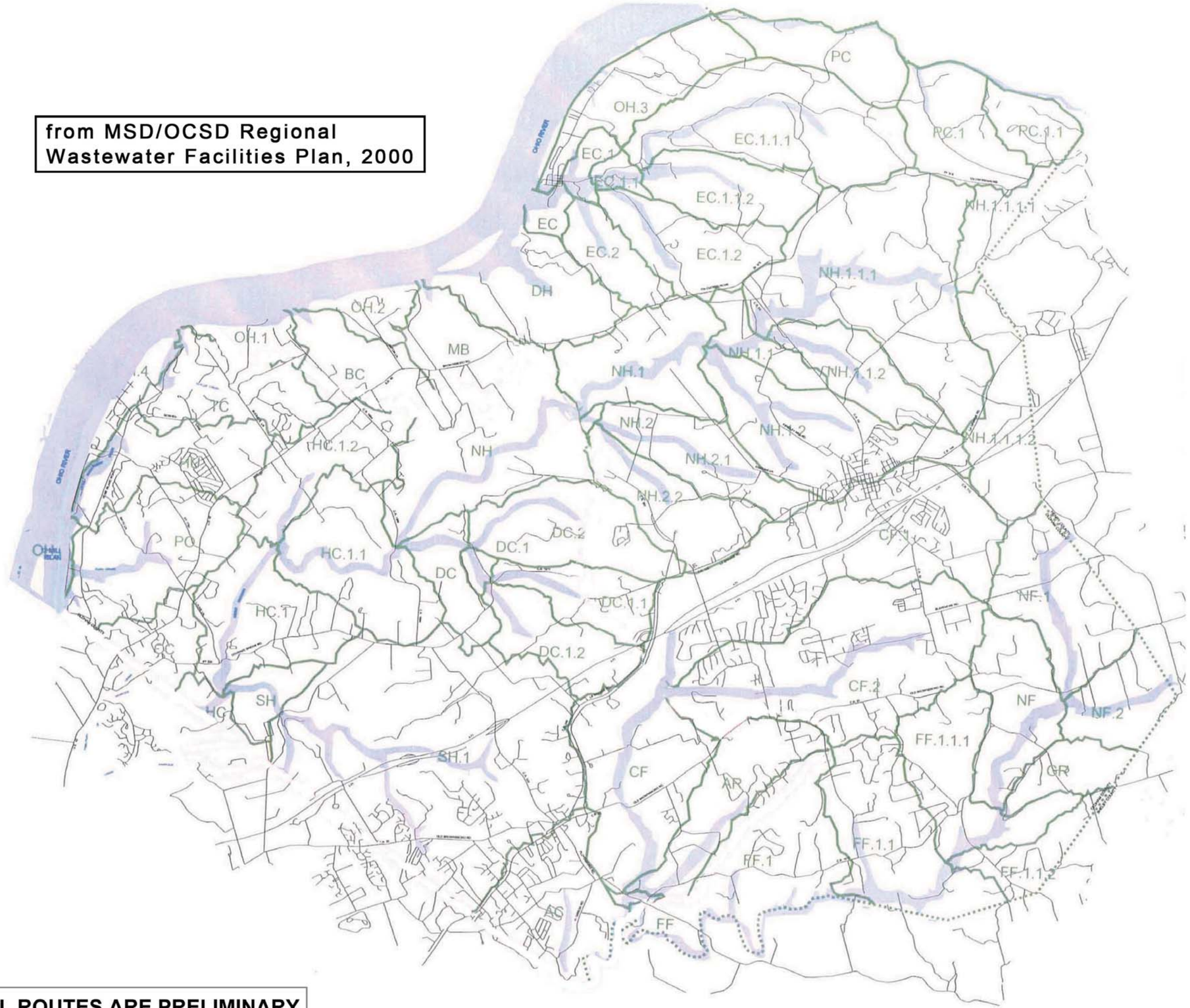
Climate

Oldham County experiences hot summers and moderately cold winters. Total precipitation for the county averages 44.5 inches per year with a mean average snowfall of 14.6 inches.

Air Quality

The Kentucky Division of Air Quality reports that much of the County, primarily along the I-71 corridor, is a non-attainment area for ozone. Construction operations involved with installation of wastewater facilities recommended should not significantly affect air quality conditions.

from MSD/OCSD Regional Wastewater Facilities Plan, 2000



ALL ROUTES ARE PRELIMINARY

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Explanation

- Flood Prone Area
- Road
- Watershed

N

0 1,800 3,600 7,200 10,800 14,400 18,000

Feet

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Figure 5-4
100-Year Floodplain

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Biological

The open fields and woodland edges common in Oldham County provide habitat for a variety of common birds and game such as dove, rabbit, groundhogs, and quail. Wooded lots provide habitat for fox, squirrel, and other small mammals. Wooded ridges, wet bottoms, good cover growth, habitat edges afforded by clear cut wood lot areas, and agriculture have contributed to a rebounding of the area's deer herd.

The 1992 *Kentucky Rivers Assessment* identified unique or outstanding habitats in Oldham County.

Wildlife Resources	Harrods Creek
Botanical Resources	Pond Creek to Mayo Lane, South Fork of Harrods Creek from I-71 to its confluence with Harrods Creek
Agricultural Lands	Ohio River, Oldham County to Meade County
Fish Resources	Unnamed tributary (first tributary) to Harrods Creek, Floyds Fork and Harrods Creek
Recreational Resource	Floyds Fork (Flatwater and backcountry boating) Harrods Creek (Whitewater boating)

Threatened/Endangered Species

Thirty-one species in Oldham County are listed as threatened or endangered by the State or Federal government, or both. The list of species of concern is presented in Table 5-1.

Table 5-1
Threatened, Endangered, and Special Concern Species
Oldham County, Kentucky

Scientific Name and Life History	Common Name and Pictures	Class	County	US Status	KY Status
Ammodramus henslowii	**Henslow's Sparrow**	Aves	Oldham	N	S
Anas clypeata	**Northern Shoveler**	Aves	Oldham	N	E
Bartramia longicauda	**Upland Sandpiper**	Aves	Oldham	N	H
Botaurus lentiginosus	**American Bittern**	Aves	Oldham	N	H
Calephelis borealis	**Northern Metalmark**	Insecta	Oldham	N	T
Chondestes grammacus	**Lark Sparrow**	Aves	Oldham	N	T
Cistothorus platensis	**Sedge Wren**	Aves	Oldham	N	S
Cryptobranchus alleganiensis alleganiensis	**Eastern Hellbender**	Amphibia	Oldham	N	S
Cyprogenia stegaria	**Fanshell**	Bivalvia	Oldham	LE	E
Dolichonyx oryzivorus	**Bobolink**	Aves	Oldham	N	S
Falco peregrinus	**Peregrine Falcon**	Aves	Oldham	PS:LE	E
Fusconaia subrotunda subrotunda	**Longsolid**	Bivalvia	Oldham	N	S
Junco hyemalis	**Dark-eyed Junco**	Aves	Oldham	N	S
Lampsilis abrupta	**Pink Mucket**	Bivalvia	Oldham	LE	E
Lampsilis ovata	**Pocketbook**	Bivalvia	Oldham	N	E
Lithasia verrucosa	**Varicose Rocksnail**	Gastropoda	Oldham	N	S
Myotis grisescens	**Gray Myotis**	Mammalia	Oldham	LE	T
Nehalennia irene	**Sedge Sprite**	Insecta	Oldham	N	E

Table 5-1 (Cont.)

Nyctanassa violacea	**Yellow-crowned Night-heron**	Aves	Oldham	N	T
Obovaria retusa	**Ring Pink**	Bivalvia	Oldham	LE	E
Orconectes jeffersoni	**Louisville Crayfish**	Malacostraca	Oldham	N	E
Passerculus sandwichensis	**Savannah Sparrow**	Aves	Oldham	N	S
Percopsis omiscomaycus	**Trout-Perch**	Actinopterygii	Oldham	N	S
Peucaea aestivalis	**Bachman's Sparrow**	Aves	Oldham	N	E
Plethobasus cyphyus	**Sheepnose**	Bivalvia	Oldham	E	E
Pleurobema plenum	**Rough Pigtoe**	Bivalvia	Oldham	LE	E
Pleurobema rubrum	**Pyramid Pigtoe**	Bivalvia	Oldham	N	E
Riparia riparia	**Bank Swallow**	Aves	Oldham	N	S
Satyrium favonius ontario	**Northern Hairstreak**	Insecta	Oldham	N	S
Thryomanes bewickii	**Bewick's Wren**	Aves	Oldham	N	S
Villosa lienosa	**Little Spectaclecase**	Bivalvia	Oldham	N	S

Cultural

The U.S. Department of Interior, National Park Service has designated 45 locations as archaeological sites within Oldham County as listed in Table 5-2. Cultural resource studies to identify additional sites may be required when wastewater projects progress towards construction. There are no known significant cultural sites that will be impacted by the proposed alternatives. Prior to completing design of the recommended alternatives, a final review of potential sites will be conducted and these sites will be avoided.

Table 5-2
National Register of Historic Places
Oldham County, Kentucky

- Ashbourne Farms
- Ashwood Avenue Historic District
- Bate, John Leslie, House
- Bondurant--Hustin House
- Bradshaw--Duncan House
- Building at 301 La Grange Road
- Carpenter-Smith House
- Central Avenue Historic District
- Central La Grange Historic District
- Clifton
- Clore, Albert E., House
- Confederate Memorial in Peewee Valley
- Ellis, Joseph H., House
- Forrester--Duvall House
- Griffith, D. W., House
- Harrods Creek Baptist Church and Rev. William Kellar House
- Hermitage, The
- Ingram, William, House
- Kellar, Abraham, House
- Locke-Mount House
- Locust, The
- McMahan House
- McMakin, William, House
- Miller, George, House
- Peebles, Dr. Thomas C., House
- Peewee Valley Confederate Cemetery
- Ritter, John, House
- Ross-Hollenbach Farm
- Russell Court
- Saint James' Episcopal Church
- Sale, Reuben, House
- Smith, William Alexander, House
- Spring Hill
- St. Aloysius Church
- Tanglewood
- Taylor, Phillip R., House
- Tuliphurst
- Van Horn--Ross House
- Waldeck Farm
- Wesley Methodist Church
- Wildwood Farm
- Wooldridge--Rose House
- Woolfolk, William, House
- Yager House
- Yew Dell Farm

Section 6 – Existing Wastewater Systems

Introduction

This section will provide a description of the existing wastewater facilities in the Planning Area.

On-Site Disposal

There was no municipal utility serving the unincorporated areas for Oldham County until OCSD was established in 1996. Prior to that, the only sewage disposal options available were individual on-site systems, package plants designed for specific developments or MSD for developments adjacent to Jefferson County. Between 1970 and 2000, the population of Oldham County increased rapidly and septic systems proliferated mainly in areas where new residences were constructed on small one-acre parcels.

Septic tanks provide wastewater management for a significant percentage of customers in the planning area. Today, approximately 6000 on-site sewage disposal systems are in use in Oldham County. The largest concentrations of septic tanks are in Crystal Lake, LaGrange Acres, Borowick Farm, Echo Valley, Greenbriar, Pewee Valley, Clorecrest, and Old Taylor Place. There are areas in the county where the soils have limitations relative to supporting this type of wastewater treatment.

This has led to some of the on-site septic systems in the planning area to fail because of the unfavorable soil and geologic conditions. Eliminating these systems from the planning area may improve surface and ground water quality. The challenge to eliminate the existing on-site systems is the high costs to construct the local and regional collections systems. The cost to extend the regional wastewater collection system to the septic tank areas is very expensive due to the long distance between the septic tank developments and the existing collection system, difficult construction due to extensive rock excavation and the larger parcels that make the cost of constructing local gravity collections expensive.

Existing Treatment Plants

The existing publicly owned and private package WWTPs in the Planning Area are listed in Table 6-1 and all of these systems have been in-service for approximately 30 to 40 years. Many of these treatment processes used in these WWTPs are old, require significant rehabilitation, and the processes will not be able to meet more stringent effluent standards.

Table 6-1
KPDES Permitted Facilities
Oldham County, Kentucky

Facility Identification[1]	KPDES No.	Service Area	Average Design Capacity (mgd)
Ash Avenue	KY0023724	South Floyds Fork	0.300
Buckner	KY0103110	KSR	0.135
Cedar Lake Lodge	KY0031798	KSR	0.020
Country Village	KY0060577	South Floyds Fork	0.060
Covered Bridge	KY0047635	Ohio River	0.140
Friendship Manor	KY0069485	South Floyds Fork	0.017
Institute For Women	KY0039004	South Floyds Fork	0.125
KY State Reformatory	KY0040126	KSR	1.000
Lockwood	KY0054674	KSR	0.045
Mockingbird Valley	KY0076813	KSR	0.040
Ohio River	KY0106143	Ohio River	1.500
Oldham Woods	KY0079026	KSR	0.100
Orchard Grass	KY0033/21	Crestwood	0.300
Paramont Estates	KY0090107	Ohio River	0.042
River Bluff	KY0043150	Ohio River	0.066
Willow Creek	KY0046264	Crestwood	0.140
		TOTAL	3.730

1 The Buckner and Covered Bridge Plants will be eliminated by July 2013

Existing Collection and Conveyance Systems

OCEA's existing collection and treatment systems in the Planning Area serve the subdivisions of Willow Creek and Orchard Grass in the Crestwood Service Area and Ash Avenue and Village Green subdivisions in South Floyds Fork Service Area. They also operate the Ohio River and Kentucky State Reformatory systems. Additionally, OCEA operates 53 lift stations. OCEA's existing collection and treatment systems in Oldham County are shown on Figure 6-1.

The existing collection and conveyances systems in the service areas were not well maintained when they were privately owned. Due to this neglect, many parts of the collection systems have problems with infiltration and inflow (I/I), as well as degradation and sedimentation. Since OCEA has taken over ownership, rehabilitation of the collection systems and elimination of overflows has been a high priority for OCEA.

Biosolids Disposal

Biosolids generated from the treatment process are stored under aerobic conditions at the various WWTPs. The stored biosolids are transported to the Kentucky State Reformatory WWTP for sand bed drying and eventual landfill disposal. During extended wet weather periods when the drying beds volume is insufficient, the biosolids are dewatered utilizing a portable belt filter press which is moved between facilities as needed.

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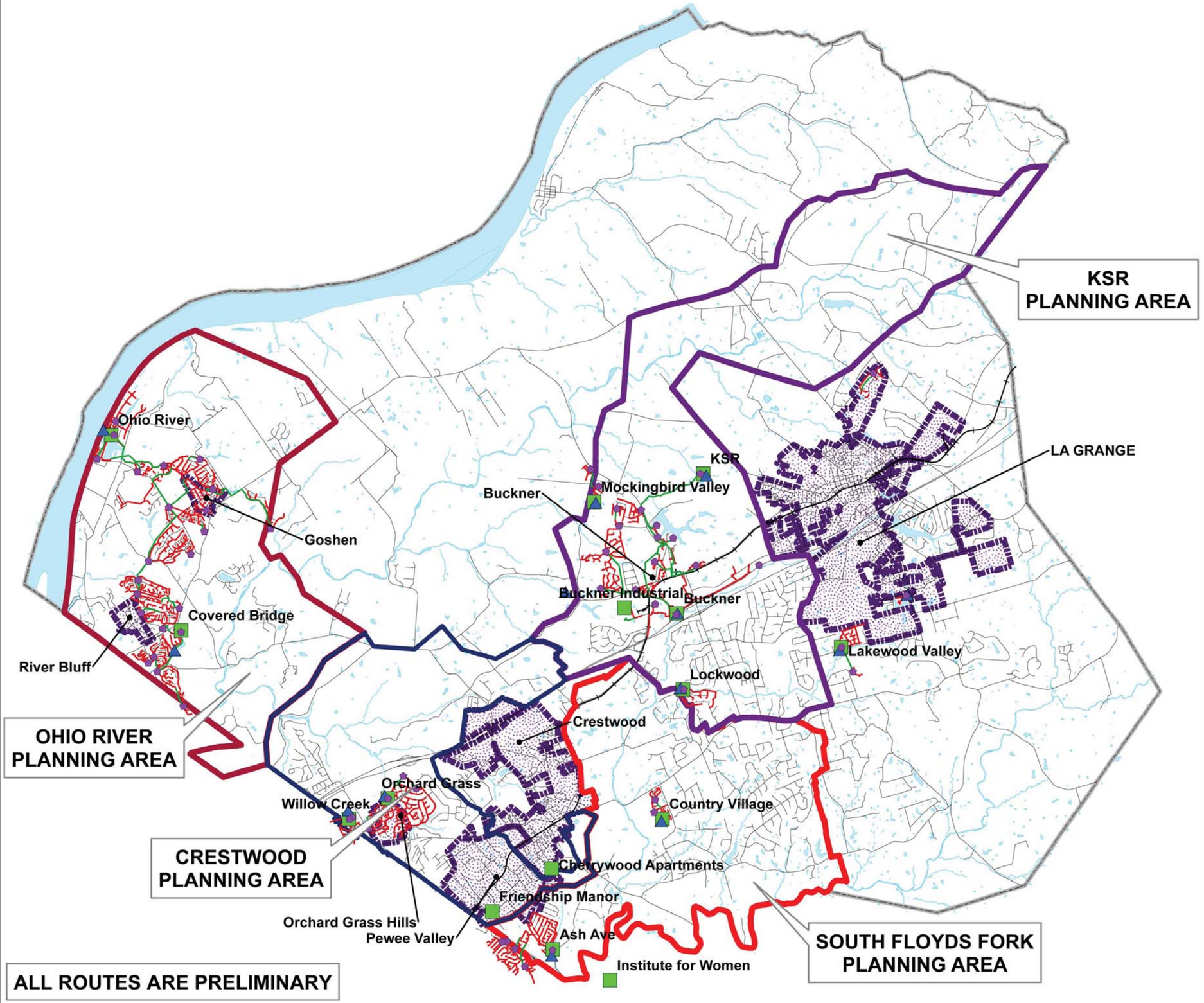
July 2013



Legend

- OCEA_Lift_Stations
- OCEA_Outfalls
- WWTP_Plants
- OCEA_Force_Main
- OCEA_Mains
- Crestwood Planning Area line
- KSR Planning Area
- Ohio River Planning Area
- South Floyds Fork Planning Area
- Railroad
- Streets
- Cities Outline
- Oldham County

N

0 1,800 3,600 7,200 10,800 14,400 18,000 Feet

Oldham County Environmental Authority

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Figure 6-1
Existing Collection and Treatment

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Table 6-2
Lift Stations
Oldham County, Kentucky

Albrecht Court	Hunters Ridge Court
Apple Patch Community	Kamer Drive
1004 Barbizon Drive	Kavanaugh Road
Boxwood Court	Kavanaugh Center
Camden Acres	KY 146 at EMS
Camp Crestwood	KY 22
1938 Cardinal Harbour Road	Mayo Lane
Cedar Point Road	Meadow Stream Court
Charlock Court	Meadowood Court
Cherry Lane	1321 Nightingale Lane
1108 Cliffwood Drive	North Oldham Elementary
Clore Lane	Northgate Court
1010 Club Drive	Old Henry Road
1200 Colonel Drive	Pebble Point
Commerce Parkway	Prospect Glen
13100 Covered Bridge Road	9207 Reamers Road #1
2112 Crestbrook Court	12313 Ridgeview Drive
Crosshill Court	Victory Court
East Oldham Middle School	Dispatchers Way
14500 Reamers Road #2	Saddler Mill Road
1100 Fawn Court	Senior Citizen Center
Floydsburg Road	Stonefield Trace
Haunz Lane	Villages at L'Esprit
4102 Hayfield Way	Wendell Moore Park
Heather Hill	Wendy Hills Drive
Heritage Hills	Woodmont, Section 5
Highway 1793	

Treatment Plant Operation, Maintenance, and Compliance

OCEA acquired the Willow Creek, Orchard Grass and Ash Avenue WWTPs from private utility companies shortly after being formed in 1996. These facilities had not been properly maintained and resulted in non-compliance issues resulting in Notices of Violation and fines in 2008. In November 2009, Veolia Water was retained to manage and operate the system. Considerable investment and changes to operation and maintenance procedures have resulted in a drastic reduction in permit excursions. In 2011, the plants met a 96 percent compliance record.

These plants are, on an average, over 40 years old, in poor condition, and have no capacity to allow new sewer connections. Four plants; Country Village, Lockwood, Paramont Estates, and River Bluff, are receiving more than 85% of their average design flow (based on reported flows for 2012). Additionally, the following plants have experienced violations of their KPDES permit limits over the year (2012): Ash Avenue, Buckner, Country Village, Covered Bridge, Institute for Women, Lockwood Estates, Oldham Woods, Paramont Estates, River Bluff, and Willow Creek. The Buckner and Covered Bridge Plants are coming off line in July 2013.

Current maintenance practices are based on meeting KPDES permit requirements. Limited capital investments are being made to renovate the facilities since the existing structures are beyond repair for long-term use and need to be replaced.

Collection System Operation, Maintenance, and Compliance

Since OCEA took over these systems, they have invested in rehabilitation of the collection systems. Collection system rehabilitation projects have been completed in the Willow Creek and Orchard Grass collections systems. The Ash Avenue Collection System Rehabilitation project is currently under construction. OCEA has established an ongoing monitoring program to identify and prioritize rehabilitation projects necessary to eliminate chronic overflows at the WWTPs.

OCEA has implemented an aggressive collection system rehabilitation program. The program components include:

- Collection System Inspection – 100 percent of the older, vitrified clay pipe (VCP) collections systems in the service areas have been inspected and defects cataloged and prioritized for repair.

- Cleaning and Root Removal- Root intrusion and blockages that lead to I/I and overflows have been identified and removed.

- Customer Calls - Recording and tracking customer calls have lead to the identification of problems. The customer calls are prioritized and repairs are made to correct the problems.

- Collection System Rehabilitation – Collection system rehabilitation projects are underway in the Willow Creek, Orchard Grass and Ash Avenue collection systems. Repairs include cured-in-place lining of VCP sewers, point repairs for defects, hammer tap and lateral connection repair and lining, root removal, manhole epoxy lining, installation of water tight covers and lids. OCEA is investing over $2 million in the rehabilitation of these collection systems.

Industrial Discharge

The OCEA WWTPs currently receive no significant industrial wastewater flows.

Section 7 – Waste Loads and Flow Forecasts

Background

Based upon population trends and projections, anticipated wastewater flows were developed for each service area. A summary of flow projections are presented in Tables 7-2.

There are no significant industrial wastewater customers in the planning areas and a negligible amount of light commercial customers that do not excessively increase flows.

These flow projections will be used for alternatives development in the following chapter and will be the basis for the sizing of associated wastewater treatment and conveyance facilities. Based on current rate of development in the service areas/ the largest potential for new flow would result from adding customer from existing septic tank areas rather than from new growth.

Infiltration and Inflow (I/I)

Based on flow and rainfall data from 2012, dry weather flows were determined for each of the existing wastewater treatment plants, see Table 7-1. These dry weather flows serve as the basis for determining the presence of I/I in the system and its severity. An estimate of infiltration is based on the average daily flow received at the plant while inflow is based on the maximum daily flow received. OCEA plans to continue their aggressive rehabilitation to improve I/I throughout the planning period.

Treatment Plant Influent Design Criteria

Table 7-3 presents the preliminary design criteria for new treatment facilities. Additional sampling will be conducted prior to final design to confirm or modify these criteria as necessary.

Wasteload Allocations

Any treatment facilities must meet the effluent limits of their KPDES permit. These limits are established through a wasteload allocation determination made prior to construction of a new discharge. Work in the Ohio River and Kentucky State Reformatory Service Areas will not require a new discharge or new allocation and, therefore, will need only to meet current permit limits. Existing Permit Limits for Ohio River and Kentucky State Reformatory can be found in Tables 7-4 and 7-5 respectively. The project proposed to treat wastewater from the South Floyds Fork and Crestwood Service Areas requires a wasteload allocation determination.

Table 7-1
Infiltration/Inflow
Oldham County, Kentucky

Facility Identification		Dry Weather Flow (mgd)	Infiltration (mgd)	Inflow (mgd)
S. Floyds Fork	Ash Avenue	0.122	0.100	1.180
	Cherrywood Apts.	0.002	0.000	0.002
	Country Village	0.024	0.033	0.457
	Friendship Manor	0.002	0.001	0.003
	Institute For Women	0.025	0.012	0.045
	TOTAL	**0.175**	**0.146**	**1.687**
KY State Reformatory	Buckner	0.140	0.056	0.502
	Centerfield Elem.	0.002	0.000	0.002
	KY State Reformatory	0.481	0.032	0.474
	Lockwood	0.003	0.039	0.330
	Mockingbird Valley	0.010	0.016	0.087
	Oldham Woods	0.033	0.008	0.169
	Torbitt & Castleman	0.009	0.014	0.650
	TOTAL	**0.678**	**0.165**	**2.214**
Ohio River	Covered Bridge	0.062	0.046	0.309
	Liberty Elem.	0.000	0.002	0.006
	Ohio River	0.372	0.082	1.228
	Paramont Estates	0.040	0.000	0.080
	River Bluff	0.043	0.015	0.090
	TOTAL	**0.517**	**0.145**	**1.713**
Crest-wood	Orchard Grass	0.136	0.071	0.683
	Willow Creek	0.039	0.044	0.667
	TOTAL	**0.175**	**0.115**	**1.350**
TOTAL ALL AREAS		**1.545**	**0.571**	**6.964**

Table 7-2
Flow Projections
Oldham County, Kentucky

	South Floyds Fork (mgd)	KY State Reformatory (mgd)	Ohio River (mgd)	Crestwood (mgd)
Current				
Avg. Flow (Res./Comm./Ind.)	0.32	0.84	0.66	0.29
I/I	1.83	2.38	1.86	1.47
Septic Connections	0.00	0.00	0.00	0.00
Average Flow	0.32	0.84	0.66	0.29
Peak Flow	2.15	3.22	2.52	1.75
Phase I (0-2 Year)				
Avg. Flow (Res./Comm./Ind.)	0.36	0.93	0.74	0.32
I/I	1.76	2.28	1.78	1.41
Septic Connections	0.20	0.05	0.05	0.05
Average Flow	0.56	0.98	0.79	0.37
Peak Flow	2.32	3.26	2.57	1.78
Phase II (3-10 Year)				
Avg. Flow (Res./Comm./Ind.)	0.43	1.14	0.90	0.39
I/I	1.47	1.90	1.49	1.17
Septic Connections	0.22	0.20	0.20	0.12
Average Flow	0.65	1.34	1.10	0.51
Peak Flow	2.12	3.24	2.59	1.68
Phase III (11-20 Year)				
Avg. Flow (Res./Comm./Ind.)	0.51	1.33	1.05	0.46
I/I	1.10	1.43	1.12	0.88
Septic Connections	0.17	0.20	0.20	0.11
Design: Average Flow	0.68	1.53	1.25	0.57
Peak Flow	1.78	2.96	2.37	1.45

Table 7-3
Preliminary Design Criteria for Wastewater Treatment
Oldham County, Kentucky

Parameter	Influent Design Criteria
$CBOD_5$	220 mg/L
TSS	217 mg/L
Ammonia-Nitrogen	25 mg/L
Phosphorus	6 mg/L

Table 7-4
Existing KPDES Permit Limits
Ohio River Wastewater Treatment Plant
Oldham County, Kentucky

Parameter	Influent Design Criteria
$CBOD_5$	30 mg/L
TSS	30 mg/L
Ammonia-Nitrogen: summer	20 mg/L
Ammonia-Nitrogen: winter	20 mg/L
Phosphorus	Report
Dissolved Oxygen	2.0 mg/L
Total Nitrogen	Report
Acute Toxicity	1.0 TUa

Table 7-5
Existing KPDES Permit Limits
Kentucky State Reformatory Wastewater Treatment Plant
Oldham County, Kentucky

Parameter	Influent Design Criteria
$CBOD_5$	10 mg/L
TSS	30 mg/L
Ammonia-Nitrogen: summer	2 mg/L
Ammonia-Nitrogen: winter	5 mg/L
Phosphorus	Report
Dissolved Oxygen	7.0 mg/L
Total Nitrogen	Report
Chronic Toxicity	1.0 TUc

Crestwood Service Area

OCEA requested a Waste Load Allocation (WLA) determination for Hite Creek, the planned discharge point for a proposed new facility to serve the Crestwood Service Area, and received the determination on October 28, 2011. The WLA was provided as a follow-up to the October 2011 meeting with the Division of Enforcement.

The WLA provided effluent limits for discharge of 1.6 mgd annual average flow to Hite Creek. All alternatives developed in the facility plan for effluent discharge to Hite Creek have been based on the WLA limits as shown in Table 7-6.

Table 7-6
Wasteload Allocation – Hite Creek Discharge
Oldham County, Kentucky

Parameter	Influent Design Criteria
$CBOD_5$	10 mg/L
TSS	10 mg/L
Ammonia-Nitrogen: summer	2 mg/L
Ammonia-Nitrogen: winter	5 mg/L
Phosphorus	1 mg/L
Dissolved Oxygen	7 mg/L
Total Nitrogen	Monitor
Total Residual Chlorine	0.11 mg/L
Toxicity	1.0 TUc
Reliability Classification	Class C

South Floyds Fork Service Area

OCEA requested on April 19, 2012 a WLA determination for discharge to the Floyds Fork Creek watershed. A follow-up meeting with the Division of Water was held on August 31, 2012 to discuss the effluent standards that would be required for alternatives that propose discharge to Floyds Fork Creek or a tributary to the creek. As of the submittal of this Plan, OCEA has not received a final WLA determination.

DOW issued a construction permit to MSD in 2011 for expansion of the Floyds Fork Water Quality Treatment Center based on a policy requiring no increase in mass loading to their existing outfall to Floyds Fork Creek. OCEA understands MSD is currently expanding its Floyds Fork Creek WQTC from an annual average flow of 3.25 mgd to a capacity of 6.5 mgd.

Section 8 – Evaluation of Alternatives

Introduction

The wastewater alternatives presented are based upon providing wastewater treatment for the entire county where appropriate. The analysis incorporates planning documents previously developed. Alternatives are considered on a service area basis as the existing wastewater facilities provide the basis for the development of alternatives. Although the Planning Area includes the entire county with the exception of the La Grange Service Area, primarily rural areas of the county are not currently considered economically feasible for development or infrastructure planning.

In earlier documents, Service Area needs were prioritized resulting in the first priority being the Kentucky State Reformatory (KSR) Area, followed by the Ohio River and Crestwood Areas; and finally the Floyds Fork Service Area. Since that time, much has been done to improve the higher priority areas including: building new plants (Ohio River); sending flow from the City of Crestwood to MSD Hite Creek WQTC; and expanding and rehabilitating the KSR WWTP, eliminating the Buckner, Buckner Industrial Tract and Covered Bridge WWTPs.. The next step, is to place more focus on the Crestwood Service Area and the South Floyds Fork Service Area.

Alternatives were developed based on providing the infrastructure to service existing customers and support new customers. Each alternative presented has the flexibility to be expanded to provide wastewater service to areas where existing individual on-site treatment systems are installed.

All proposed alternatives are based on a regional treatment approach. In addition, to fulfill a request by the Kentucky Department of Corrections, the alternatives consider treatment of wastewater from the Institute for Women in lieu of their own wastewater treatment facility and discharge. The Institute for Women's facility is adjacent to the South Floyds Fork Service Area. The letter from the Department of Corrections to OCEA requesting consideration of regionalization opportunities is included in the appendices.

Wastewater Treatment Alternatives

Alternatives developed for the Service Areas are presented here outlining the infrastructure components for each alternative. After the alternatives were identified, an initial review was conducted to determine their feasibility and compliance with regulatory requirements and OCEA institutional needs. If the alternative was found not to comply with existing environmental regulations, institutional consideration, or incapable of being evaluated due to lack of information, the alternative was removed from further consideration.

Kentucky State Reformatory Service Area

Currently, seven wastewater treatment plants operating within the Kentucky State Reformatory (KSR) Service Area: Buckner, Centerfield Elementary, KSR, Lockwood Estates, Mockingbird Valley, Oldham Woods, and Torbitt & Castleman. In 1999, a Facilities Plan was developed for the KSR Service Area which resulted in the consolidation of several small package treatment plants with the construction of the Buckner facility. It also planned a second phase to eliminate many of the remaining package plants in the area. The planning document developed in 2007 also recognized the need to eliminate the remaining package plants and noted the KSR Service Area as a first priority. Given the age of many of

these plants, the number of violations, and the excess flows received, this area is still a primary focus and "no action" is not an option. The 2007 Plan considered five alternatives for the KSR Service Area:

- *Alternative 1* – A new single, tertiary treatment facility located at KSR with a discharge to the North Fork of Cedar Creek.
- *Alternative 2* – A new single, secondary treatment facility located at KSR with discharge to the Ohio River.
- *Alternative 3* – Two new tertiary treatment facilities; one at KSR discharging to the North Fork of Cedar Creek and the other at the Buckner WWTP site discharging to North Currys Fork.
- *Alternative 4* – Two new secondary treatment facilities; one at KSR discharging to the Ohio River and the other at the Buckner WWTP site discharging to North Currys Fork.
- *Alternative 5* – A new single, secondary treatment facility located on OCEA's Westport property and discharging to the Ohio River.

The selected alternative was Alternative 3, constructing two new tertiary wastewater treatment plants at KSR and Buckner. This selection was later amended by letter dated December 10, 2010 to expand the plant at KSR and treat flow at that site.

Ohio River Service Area

This service area includes the incorporated cities of Goshen and River Bluff and now encompasses five wastewater treatment facilities: Covered Bridge, Liberty Elementary, Ohio River, Paramont Estates, and River Bluff. The plan developed for this service area was developed as part of the 2002 *MSD/OCSD Regional Wastewater Facilities Plan* and the 1999 *Oldham County Action Plan* (OCAP). These planning documents evaluated five alternatives for the area:

- *Alternative 1A* – Ohio River Wastewater Treatment Plant
- *Alternative 1B* – Harrods Creek Wastewater Treatment Plant
- *Alternative 1C* – Pond Creek Wastewater Treatment Plant
- *Alternative 1D* – Convey to MSD Hite Creek WQTC
- *Alternative 1E* – Covered Bridge Wastewater Treatment Plant

The selected plan was Alternative 1A to build a new wastewater treatment plant discharging directly to the Ohio River to eliminate package plant discharges in the area. This regional treatment facility has been constructed and OCEA continues to work to connect the remaining package plants in the area to this system.

Crestwood and South Floyds Fork Service Areas

The wastewater management alternatives presented are based on providing service to existing and future customers within the Crestwood and South Floyds Fork Service Areas. These alternatives were discussed with the DOW at the RFP project kick-off meeting on June 22, 2012 and presented in a public hearing conducted at OCEA's office on August 27, 2012. The minutes from the kick-off meeting and the Public Hearing Transcript are provided in Appendix 1-6 and 1-7.

These alternatives were developed to provide the necessary infrastructure to service existing and new customers. Each alternative presented has the flexibility to be expanded to provide wastewater service to areas where existing individual/septic treatment systems are installed.

All the proposed alternatives are based on a regional system treatment approach and include options for regional treatment with MSD. In addition, to fulfill a request by the Department of Corrections, most of the alternatives presented include providing wastewater treatment for the Institute for Women's Facility. The Institute for Women's Facility is adjacent to the South Floyds Fork Service Area.

Wastewater Treatment Alternatives and Initial Screening

Alternatives developed for the Crestwood and South Floyd Forks Service Areas are presented in the following subsections. This section outlines the infrastructure component for each alternative. After the alternatives were identified, an initial review of the alternatives was conducted to determine compliance with regulatory requirements and OCEA institutional needs. If the alternative was found to not comply with existing environmental regulations, or institutional consideration, the alternative was removed from further consideration.

Alternative 1 - Renovate and Expand Existing Orchard Grass WWTP and Willow Creek WWTP

Alternative 1 includes replacing and expanding the existing Orchard Grass WWTP and Willow Creek WWTPs and constructing an effluent conveyance system to a new outfall on Hite Creek. These plants were constructed in high density housing areas and there is limited area to replace and expand the existing facilities. This alternative does not regionalize treatment and the facilities are situated at the back ends of densely populated subdivisions that do not allow or want regular large truck traffic to and from the site. Therefore, Alternative 1 was not considered further.

Alternative 2 - Renovate the MSD Hite Creek WWTP to Accept Flow

Alternative 2 includes a new pump station at Orchard Grass WWTP and new force main to convey raw sewage to MSD's Hite Creek WQTC. This alternative would require OCEA to construct the infrastructure to transport the raw sewage to Hite Creek WQTC and MSD would have to accept responsibility for treatment and establish a wholesale treatment rate for their services.

Regional treatment with MSD was the alternative presented and recommended in the 2002 MSD/OCSD Regional Facilities Plan. However, shortly after that time, MSD was sued by the USEPA and required to eliminate sanitary sewer overflows (SSOs). Subsequently, MSD entered into an agreement to eliminate package plants in the Prospect and Hunting Creek service areas. By doing so, the volume available for treatment of OCEA wastewater is no longer available at the Hite Creek WQTC. For MSD to accept wastewater from OCEA, the Hite Creek WQTC would require expansion. MSD has expressed a willingness to expand the Hite Creek WQTC to accept wastewater from these service areas. OCEA would be responsible for paying their portion of costs for the treatment plant expansion.

Alternative 3 – New Treatment at New Orchard Grass Regional WWTP

Alternative 3 includes a new Regional WWTP to treat wastewater flow from the Crestwood Service Area and discharging to Hite Creek. This new Regional WWTP would be adequately sized to treat flow from the existing Orchard Grass and Willow Creek WWTPs as well as providing adequate capacity for future growth in the service area. This alternative would require the construction of a new tertiary wastewater treatment plant to meet projected flow through the 20-year planning period.

Alternative 4 - No Action

The "No Action" alternative does not require additional sewers, pumping stations, or expansion of the existing WWTPs nor does it provide for anticipated growth in the Crestwood Service Area. The alternative would include maintaining the present wastewater treatment, collection and conveyance without needed improvements. The advantage of this alternative is no construction expenditures or environmental impact from the direct effects of construction of new facilities. However, this alternative fails to address the current sewer sanctions, population growth, plant condition, plant capacity, or potential additional state sanctions. Therefore, the "No Action" alternative is not a viable alternative and will not be considered further.

South Floyds Fork Service Area

Alternative 1 - New Ash Avenue WWTP

Alternative 1 proposes to construct a new wastewater treatment plant on the existing site and decommission the existing Ash Avenue WWTP. The treatment plant would also be expanded to include sufficient capacity to treat wastewater from new developments in the service area and expand the collection system to connect the existing Cherrywood Apartment Complex and Country Village WWTP to the Ash Avenue system. This alternative does not include capacity to treat flow from the Institute for Women's existing WWTP.

The existing site in which the Ash Avenue WWTP is situated is within the 100-year flood plain. In the event OCEA could develop flood plain compensation to offset impacts from the new facility, the flood protection measures and consequential access issues would not allow enough area for construction of a new facility. This was not considered a viable alternative and was not evaluated further.

Alternative 2 - MSD Floyds Fork WWTP

Alternative 2 includes a new pump station to replace the existing Ash Avenue WWTP and a new force main to convey wastewater to MSD's Floyds Fork WQTC by purchasing capacity in the Long Creek Way Pump Station or constructing a new conveyance system to the Floyds Fork WQTC. The Floyds Fork WQTC is approximately 4.5 miles from the Ash Avenue WWTP. MSD is currently expanding the Floyds Fork WWTP and did not include capacity for taking flow from the Ash Avenue or the Institute for Women WWTPs. MSD would have to add additional capacity to meet current flow projections from the Ash Avenue and Institute for Women WWTPs. The DOW and USEPA are developing a TMDL for the Floyds Fork Creek watershed and until the TMDL is completed, DOW is not allowing additional loadings to the creek or the transfer of any waste loads.

MSD has expressed a willingness to accept wastewater from OCEA, however based on the environmental issues related to the Floyds Fork watershed and discussions with DOW; OCEA does not want to consider alternatives that maintain discharges in the Floyds Fork Watershed and therefor this alternative is not considered a viable long term solution and was not evaluated further.

Alternative 3 - Institute for Women New Regional WWTP

Alternative 3 proposes constructing a new wastewater treatment plant on the grounds of the Institute for Women facility. The new WWTP would be adequately sized to treat flow projections for OCEA's South Floyds Fork Service Area and the Institute for Women facility. The existing Ash Avenue, Country Village and Institute for Women WWTPs would be decommissioned.

This alternative would require the construction of a new pump station at the existing Ash Avenue and Institute for Women sites and sewers, as required, to convey the sewage to the new WWTP site. The existing tanks could be renovated and used for wet weather storage. OCEA requested a waste load allocation from DOW for this alternative. DOW stated that they could not provide reasonable effluent standards for this alternative. Due to the absence of regulatory support and OCEA preference to eliminate discharges in the Floyds Fork Watershed this alternative is not considered a viable solution and was eliminated.

Alternative 4 - Combined Regional Treatment in the Crestwood Service Area at the New Orchard Grass Regional WWTP

Alternative 4 includes construction of a new regional WWTP in the Crestwood Service Area to treat flows from both the Crestwood Service Area and the South Floyds Fork Service Area. This alternative would eliminate several existing package WWTPs and send their flows to a regional WWTP owned and operated by OCEA. All existing discharges from private and public WWTPs would ultimately be eliminated from the Floyds Fork watershed.

A new force main would be constructed from the Ash Avenue WWTP to the Orchard Grass WWTP to convey all the flows from the South Floyds Fork Service Area to the Crestwood Service Area. The WWTPs that would be decommissioned after implementation of this alternative are Willow Creek WWTP, Orchard Grass WWTP, Ash Avenue WWTP, Cherrywood Apartments WWTP, Friendship Manor WWTP, Country Village WWTP and the Institute for Women WWTP. The existing tanks could be renovated and used for wet weather storage in this alternative, if needed.

Alternative 5 - Combined Regional Treatment in the Crestwood Service Area and Treatment at MSD Hite Creek WQTC

Alternative 5 is similar to Alternative 4 with the exception of treatment location. In Alternative 5, OCEA would pay for the construction of a new treatment capacity at the MSD Hite Creek WQTC rather than construction their own regional treatment plant. Flows from both the Crestwood Service Area and the South Floyds Fork Service Area would be treated at the expanded Hite Creek WQTC. This alternative would eliminate several existing package WWTPs and send their flows to a single regional WWTP discharging to Hite Creek. All existing discharges from private and public WWTPs from OCEA systems in these service areas would be eliminated from the Floyds Fork watershed.

A new force main would be constructed from the Ash Avenue WWTP to the Orchard Grass WWTP to convey all the flows from the South Floyds Fork Service Area to the Crestwood Service Area. The WWTPs that would be decommissioned are Willow Creek WWTP, Orchard Grass WWTP, Ash Avenue WWTP, Cherrywood Apartments WWTP, Friendship Manor WWTP, Country Village WWTP and the Institute for Women WWTP.

The existing tanks may be renovated and used for wet weather storage in this alternative, if needed.

Alternative 6 - No Action

The "No Action" alternative does not require additional sewers, pumping stations, or expansion of the existing WWTPs nor does it provide for anticipated growth in the Crestwood Service Area. This alternative would include maintaining the present wastewater treatment, collection and conveyance without the needed improvements. The advantage of this alternative is no construction expenditure and no environmental impact for the direct effects of construction of new facilities. However, this alternative fails to address the current sewer sanctions, population growth, plant condition, plant capacity or address potential state sanctions. Therefore, the "No Action" alternative is not a viable alternative and was eliminated.

Alternatives Evaluation

The alternatives evaluation completed in previous plans for the Ohio River Service Area resulted in the construction of the Ohio River Wastewater Treatment Plant and plans to eliminate package plants by connecting to this system. Similarly, the Kentucky State Reformatory Service Area will continue to consolidate and eliminate package plants and treat the flow at the KSR or Buckner WWTPs.

Nine alternatives were developed for the two remaining service areas; four in the Crestwood Service Area and five in the South Floyds Fork Service Area. After initial review and consideration by the OCEA Board, the selected regionalization alternatives recommended for further evaluation were:

Crestwood Service Area

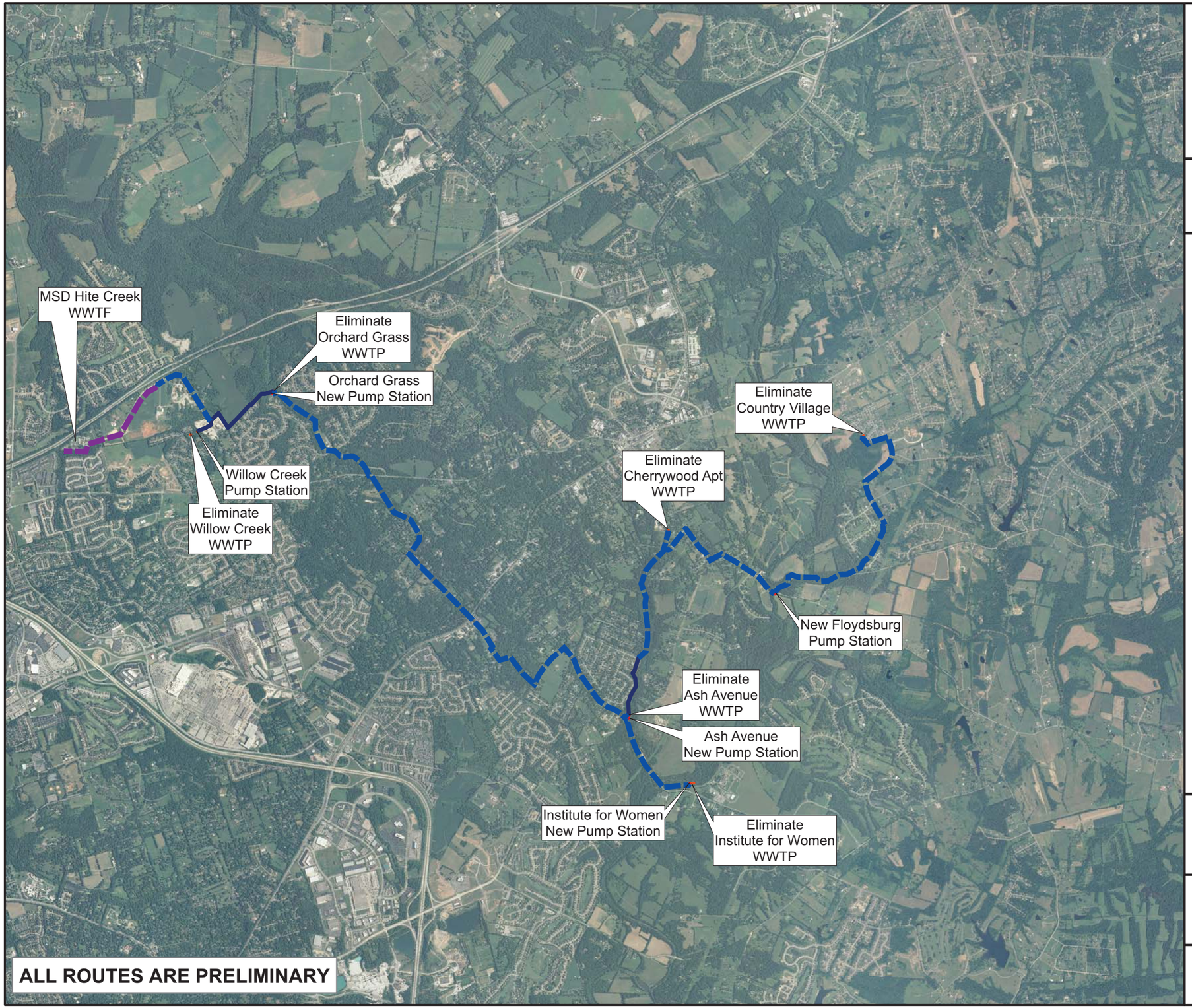
- Alternative 2 – Treatment at MSD Hite Creek WQTC
- Alternative 3 – New Treatment at New Orchard Grass Regional WWTP

South Floyds Fork Service Area

- Alternative 4 – Combined Regional Treatment in the Crestwood Area at the New Orchard Grass Regional WWTP
- Alternative 5 - Combined Regional Treatment in the Crestwood Area at MSD Hite Creek WQTC

The South Floyds Fork Service Area Alternatives 4 and 5 are only feasible if OCEA or MSD constructs new wastewater treatment capacity in the Crestwood Service Area. Therefore, to evaluate these alternates, the dependent alternatives are combined and evaluated as total solutions for both the Crestwood and South Floyds Fork Service Areas. The combined alternatives evaluated are:

1. **Construction of New Treatment Capacity at the MSD Hite Creek WQTC:** This alternative combines the *Crestwood Service Area* Alternative 2 – Treatment at MSD Hite Creek WQTC and South Floyds Fork Alternative 5 - Combined Regional Treatment in the Crestwood Area at MSD Hite Creek WQTC. The Alternative Systme components and preliminary conveyance system configuration are shown on Figure 8-1.



OCEA

Regional Wastewater Facility Plan

July 2013

Legend

- COMBINED TREATMENT SEWER MAIN
- MSD REGIONAL EXTENSION
- EXISTING SEWER MAINS
- Institute for Women Pump Station
- Orchard Grass Pump Station
- Ash Ave Pump Station
- Floydsburg Pump Station
- WWTPs

N

0 900 1,800 3,600 5,400 7,200 9,000 Feet

Oldham County Environmental Authority operated by Veolia

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Figure 8-1
Construction of New Treatment Capacity at the MSD Hite Creek WQTC

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2. **Construction of a New Orchard Grass Regional WWTP:** This alternative combines the *Crestwood Service Area* Alternative 3 – New Treatment at a New Orchard Grass Regional WWTP and South Floyds Fork Alternative 4 – Combined Regional Treatment in the Crestwood Area at the New Orchard Grass Regional WWTP. This Alternative system components and preliminary conveyance system configuration are presented on Figure 8-2.

Capital and Present Worth Costs

Projected present worth costs for the alternatives are based on the infrastructure elements required to differentiate the alternatives and did not all common infrastructure elements such as the portion of the system necessary to eliminate the Country Village package treatment plant. The costs for all infrastructure elements and cash flow analysis are included in Chapter 10, Evaluation of Recommended Regional Facility Plan and the recommended implementation plan for the selected alternative.

Combined Alternative 1: Construction of New Treatment Capacity at the MSD Hite Creek WQTC

In this alternative MSD would construct new treatment capacity at the Hite Creek WQTC to serve the Crestwood and South Floyds Fork Service Areas. OCEA would enter into an interlocal agreement with MSD that would establish the conditions and costs to provide the required treatment capacity. OCEA would be responsible for conveying the sewage to the Hite Creek WQTC. Figure 8-1 presents the infrastructure requirements for this alternative,

Several meetings were held with MSD from December 2012 thru April 2013 to establish a framework for the interlocal agreement and provide the basis for evaluating this alternative. The cost bases used to evaluate treatment costs at the Hite Creek WQTC are presented in Table 8-1 and the basis for these assumptions are discussed below.

Table 8-1 Cost Basis for Treatment at MSD Hite Creek WQTC

MSD Hite Creek	Assumption
Reserved Capacity	1.25 mgd
Year 1 Sewage	0.827 mgd
Year 1 Treatment Costs[1]	$3.80 per 1000 gallons
Annual Rate Increase	5.5%
New Flow per Year	7,980 gpd
New Connections per Year	28
Capacity Fee per Connection	$1000

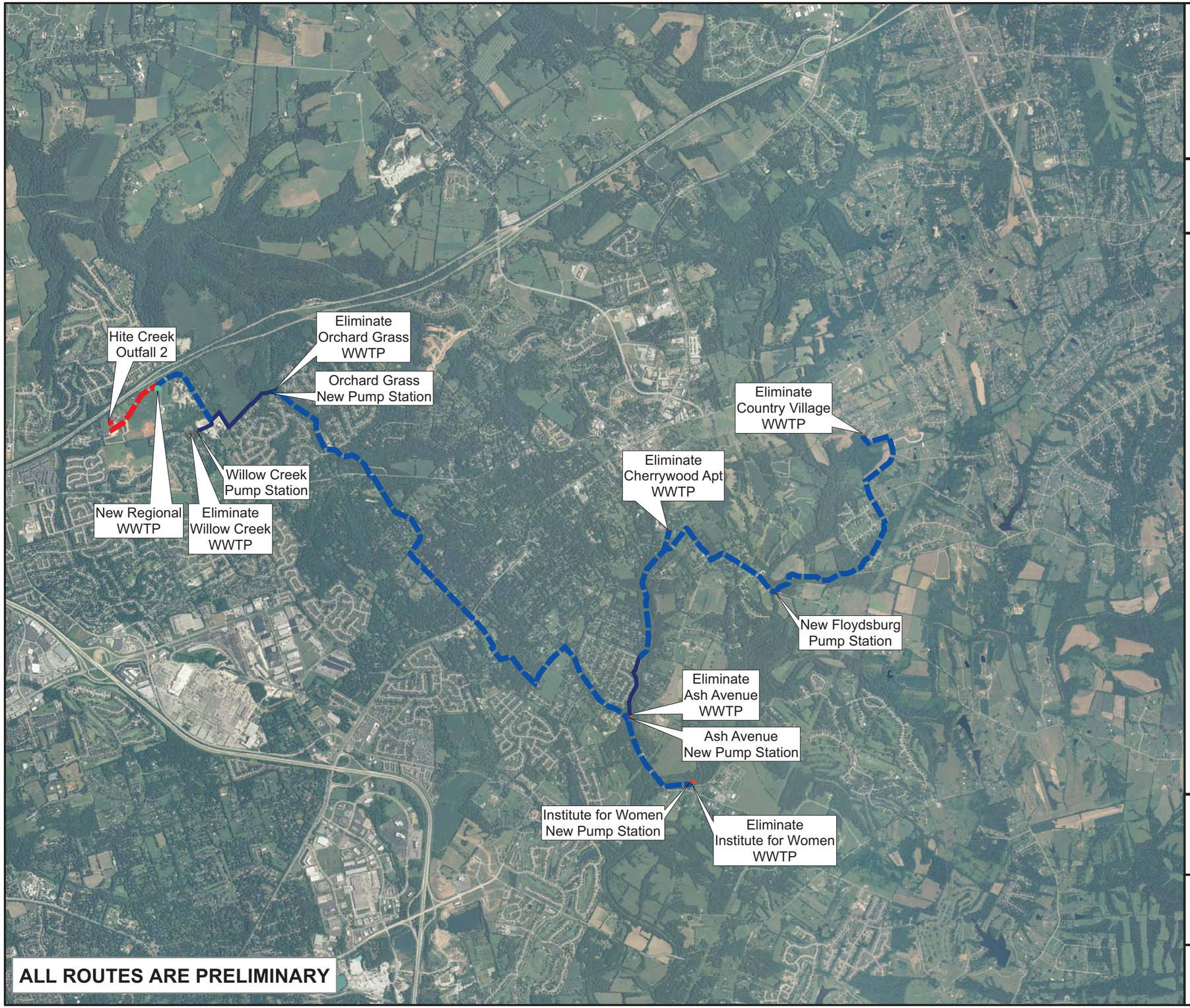
1. MSD Treatment costs include OCEA capital costs contribution for construction of new capacity at the Hite Creek WQTC.

MSD Treatment Costs for the Hite Creek WQTC is based on the first year rate (Year 1 rate) of $3.80 per 1000 gallons. This rate was provided to OCEA by MSD. MSD agreement conditions would require OCEA's treat rate to be subject to MSD annual rate increases. An annual increase in the treatment rate

OCEA

Regional Wastewater Facility Plan

July 2013



Legend

- Crestwood New Regional WWTP
- COMBINED TREATMENT SEWER MAIN
- EXISTING SEWER MAINS
- Hite Creek Outfall Sewer Main
- Hite Creek New Outfall
- Institute for Women Pump Station
- Orchard Grass Pump Station
- Ash Ave Pump Station
- Floydsburg Pump Station
- WWTPs

N

0 900 1,800 3,600 5,400 7,200 9,000 Feet

Oldham County Environmental Authority Operated by VEOLIA WATER

HAGERTY CONSULTING, L.L.C. ENGINEERING PLANNING & MANAGEMENT

Figure 8-2
Construction of a
New Orchard Grass Regional WWTP

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of 5.5% is assumed for the 20 year present worth planning period. This assumed annual rate increase is based on MSD's programed rate increase included in their Integrated Overflow Abatement Plan (IOAP). The recommended annual rate increase included in the IOAP is 5.5% per year through 2024. Using an annual increase of 5.5% is lower than the rate increases MSD has experienced over the past 10 years. MSD high volume rate has increased from $2.49 per 1000 gallons metered flow in 2004 to $3.88 in 2012, approximately 7.0% per year. MSD's utility rate has increased an average of 5.8% since 2001 (not including the 33% consent order surcharge in 2008) based on the information contained in the July 30, 2012, Fiscal Year 2013 Proposed Budget and Rate Increase presentation to MSD's Board.

OCEA would be subject to a MSD Capacity Fee for all new connections. OCEA would not have to pay the full $1,500 capacity fee but a portion that reflects the impact of new service. This was assumed to be $1000 per new residential connection and increase at a rate of 1% per year.

The present worth analysis assumes a growth rate of 28 Equivalent Residential Units (ERU) which equates to an annual flow increase of 7980 gallons per day (gpd) each year.

Table 8-2: Combined Alternative 1: Construction of New Treatment Capacity at MSD Hite Creek WQTC

Facilities	Quantity	Unit	Unit Costs ($)	Estimated Costs
Pump Stations				
Orchard Grass	1,15	mgd	$315,000	$315,000
Ash Avenue	0.65	mgd	$257,250	$257,250
Friendship Manor	0.10	mgd	$115,500	$115,500
Institute for Women	0.14	mgd	$147,000	$147,000
Restoration, Telemetry, Special Fittings (15%)				$125,213
Subtotal				**$959,963**
Gravity Sewers				
12-inch	800	LF	$56.70	$45,360
15-inch	5,060	LF	$60.90	$308,154
Restoration, Street Repairs & Special Fittings (15%)				$53,027
Subtotal				**$406,541**
Forcemains				
6-inch	4,030	LF	$47.25	$190,418
10-inch, In Roadway	3,090	LF	$78.75	$243,338
12-inch	25,230	LF	$78.75	$1,986,863
12-inch, in Roadway	7,615	LF	$94.50	$719,618
Jack and Bore	770	LF	$630.00	$485,100
Restoration, Street Repairs & Special Fittings (15%)				$471,035
Subtotal				**$4,096,372**
Collection System Development Costs				
Easements	46,595	LF	$6.00	$279,570
Legal, Administration & Specialty Services (10%)				$546,287
Contingencies and Technical Services (25%)				$1,365,719
Estimated Collection System Capital Costs				**$7,654,452**
Average Annual O&M Costs				
Treatment and Capacity Fees				$1,175,049
Total Average Annual O&M Costs				**$1,175,049**
Present Worth of O&M Costs (@7%)				**$48,171,712**
Total Present Worth Costs – Hite Creek WQTC Alternative				**$55,826,164**

O&M costs and Present Worth Calculations provided by DOW

Combined Alternative 2: Construction of a New Orchard Grass Regional WWTP

South Floyds Fork Service Area Alternative 4 includes construction of a new regional WWTP in the Crestwood Service Area to treat flows from both the Crestwood and South Floyds Fork Service Areas. An integrated conveyance system would be constructed to convey flow from the South Floyds Fork Service Area to the new regional WWTP in the vicinity of Hite Creek. Figure 8-2 presents the infrastructure requirements for this alternative.

Wastewater Treatment Alternatives

The existing wastewater treatment plants in the planning area have reached their useful life expectancy and are not adequately sized to manage existing flows or new effluent standards. A new regional wastewater treatment plant is proposed to treat existing and new wastewater flows within the Crestwood and South Floyds Fork Service Areas. The projected capacity and treatment needs of the new regional wastewater treatment plant are listed below.

Table 8-3
Design Criteria for Regional Wastewater Treatment Plant
Crestwood and South Floyds Fork Service Areas
Oldham County, Kentucky

Parameter	Design Criteria	
	Influent	Effluent
Average Design Flow	1.25 mgd	--
Peak Hour Flow	3.25 mgd	--
$CBOD_{5/}$	220 mg/L	10 mg/l
TSS	217 mg/L	10 mg/l
Ammonia-Nitrogen	25 mg/L	2 mg/l – summer 5 mg/l - winter
Phosphorus	6 mg/L	1 mg/l

In addition to these treatment criteria, the new regional treatment facility must consider the following:

- Demonstrated Performance – The treatment process should have a demonstrated performance of a minimum of five treatment plants of similar or larger capacity for a period of five to ten years of continuous operation.
- Meet water quality standards of the Waste load Allocation.
- Provide capacity for continued growth in the Planning Area.
- Flexibility for expansion and modification for future capacity and water quality standards.
- Capital and operating costs
- Consistent with existing treatment plant operations and staff training

In order to properly evaluate the regionalization alternatives, treatment process alternatives must first be evaluated. Three treatment system alternatives are presented for consideration and evaluation for the new regional treatment plant: continuous loop reactor, sequential batch aeration with continuous feed clarifiers, and sequential batch reactor.

Continuous Loop Reactor (Oxidation Ditch) Treatment System

The continuous loop reactor, oxidation ditch system is one of the most widely used processes available for biological wastewater treatment. Continuous looped reactor systems have been in operations in the United States since the 1970. The aeration process is based on extended aeration and is designed with a solids retention time (SRT) of 8 to 18 days, as necessary to achieve full nitrification of ammonia. The continuous loop system can be upgraded to provide treatment to remove nutrients from raw sewage. OCEA currently operates a continuous loop, extended aeration system at the Kentucky State Reformatory Facility (KSR Wastewater Treatment Plant).

A schematic diagram of the treatment system is shown on Figure 8-3 and described in the following sections.

- Headworks – The headworks consist of a flow meter, automatic, mechanically cleaned screen, with 0.25 inch opening, emergency by-pass channel with a 1 inch, manually cleaned bar rack. The peak flow capacity of each channel will be a minimum of 3.25 mgd.

- Grit Removal - The existing wastewater treatment plants have not had equipment operational of maintenance issues related to grit. The proposed treatment plant will not include grit removal, however the necessary headloss and spacing will be provided to allow future installation of a vortex type grit removal system.

- Continuous Looped Reactor – A closed loop, multi-channel oxidation ditch configuration with surface aeration is proposed for biological treatment. Two separate oxidation ditches will be provided and has been preliminary sized based on 15 lbs./day/1000 cubic feet of reactor volume. The surface aeration system is sized based on an oxygen demand of 1.5 lbs. oxygen per lb. BOD removed and 4.6 lbs. oxygen per lb. ammonia removed. The oxidation ditches reactor volume is 1.04 million gallons. One 100 horsepower, VFD driven, surface aerator will be needed for each ditch and the operating horsepower at 1.25 mgd is 90 hp.

- Secondary Clarifiers - Two 45-foot diameter circular clarifiers are included in the preliminary process configuration. The clarifiers liquid is based on the 10 State Standards, surface loading rate for extended aeration, single stage nitrification of 1000 gpd/day / sq. ft. and solids loading rates of 35 lbs./day/sq. , at maximum day flow and RAS return rate, based on a MLSS concentration of 3200 mg/l. The average surface overflow rate is 395 gpm/day/sq. with one unit out of service is 790 gpm/day/sq. ft. The weir overflow rate is 11,500 gpd/linear foot. All design parameters meet 10 State Standard Requirements.

- Phosphorus Removal - Phosphorus removal will be accomplished by adding a metal salt. The chemical feed system has been designed to meet the peak hour flow rate at an influent phosphorus level of 6 mg/l and an effluent limit of 1.0 mg/l. A safety factor of 2 will be applied to the calculated dosage rate and a redundant pump will be installed to provide system reliability. The metal salts will be delivered and stored in a 6000 gallon tank which provides more than 30 day storage of chemicals.

- RAS/WAS System - RAS and WAS will be conveyed from the secondary clarifiers to the head of the oxidation ditch or into the WAS storage basin by variable frequency drive solids handling

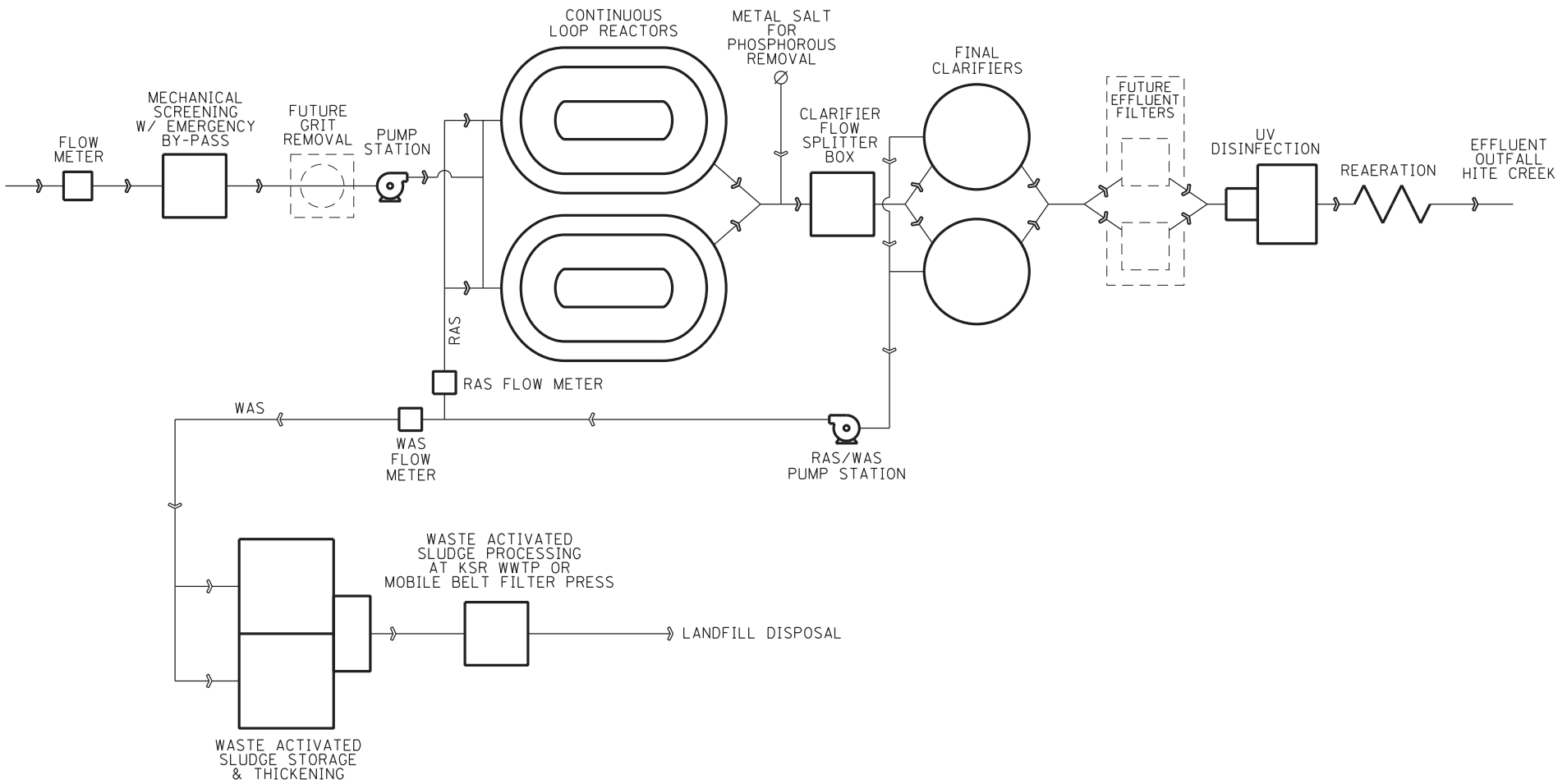

FIG 8-3

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Drawn by: C. Jones

Designed by: J. Hagerty

Date: April 2013

CONTINUOUS LOOP REACTOR - PROCESS FLOW DIAGRAM
OLDHAM COUNTY ENVIRONMENTAL AUTHORITY
NEW REGIONAL WASTE WATER TREATMENT PLANT
OLDHAM COUNTY, KENTUCKY

HAGERTY CONSULTING, LLC.
ENGINEERING PLANNING & MANAGEMENT

Oldham County Environmental Authority

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pumps. The RAS/WAS system will be a combined pumping system and will have dedicated flow meters to monitor return and wasted sludge rates and volumes. WAS rate will be automatically controlled by a motorized valve and total wasted sludge accumulating controller. The plant operator will control total gallons wasted by dialing in the RAS return rate and the desired WAS volume and flow rate into the controller. An estimated 19,000 gallons of sludge will be wasted each day at design capacity. The RAS controller will allow either influent flow paced RAS return or flow based (gpm) control.

- Final Filters - Space and hydraulics requirements to allow installation of final filters in the future will be provided to allow the facility to meet more stringent effluent standards in the future.

- Ultraviolet Disinfection and Dissolved Oxygen Content - The ultraviolet (UV) disinfection system will be designed to transmit the 10 State Standard required dosage of 30,000 uW-s/cm. sq. (30mJcm. sq.) to meet an E. coli. Standard of 130 colonies per 100 milliliters year around and a weekly maximum of 240 colonies per 100 milliliters at peak flow rates. An in-channel UV system will be designed with a minimum of two channels. After UV disinfection, the plant effluent will be aerated to meet a DO standard of 7 mg/l.

- Flow Measurement - Final effluent flow measurement will be provided using a V-notched weir or open channel flow device.

- Operation Building - A combined electrical/control system and operations building will be provided. The building will be approximately 1200 sq. ft. and include an area for operating reports documentation, storage and process testing.

- WAS Sludge Processing – The WAS will be stored in two, 215,000 gallon, aerated sludge holding tanks for processing and landfill disposal. The aerated sludge storage will be constructed with decant valves to allow thickening of the WAS. The aerated storage will provide approximately 45 days of storage volume based on a 2% sludge concentration. OCEA operates several regional and small package type wastewater treatment systems and several times a year schedules the use of a mobile belt filter press to dewater the sludge. The dewatered sludge is then transported to one of two landfills under contract to OCEA. In the warmer, dryer periods of the year, OCEA will transport the sludge to the KSR wastewater treatment plant, dry the liquid sludge on the existing sand drying beds and transport the dried sludge to the landfills for disposal.

Sequencing Aeration with Continuous Clarification Treatment System

The Sequential Batch Oxidation with Continuous Clarification Treatment System (SEQUOX) has been developed by the AeroMod Company and is designed with an internal surge tank to allow the clarifiers and downstream processes to operate in a continuous mode and not in batch operations. The oxidation process has two aeration/nitrification tanks per operating train, separated by the surge tank. Chemicals for phosphorus removal are added and mixed prior to the flow entering the final clarifiers. The SEQUOX process can handle surges up to a 4:1 sustained peak flow rate and offers peak flow capacity for collections systems that have inflow and infiltration problems. Aeration is provided by flexible membrane diffusers.

A schematic diagram of the treatment system is shown on Figure 8-4 and described in the following

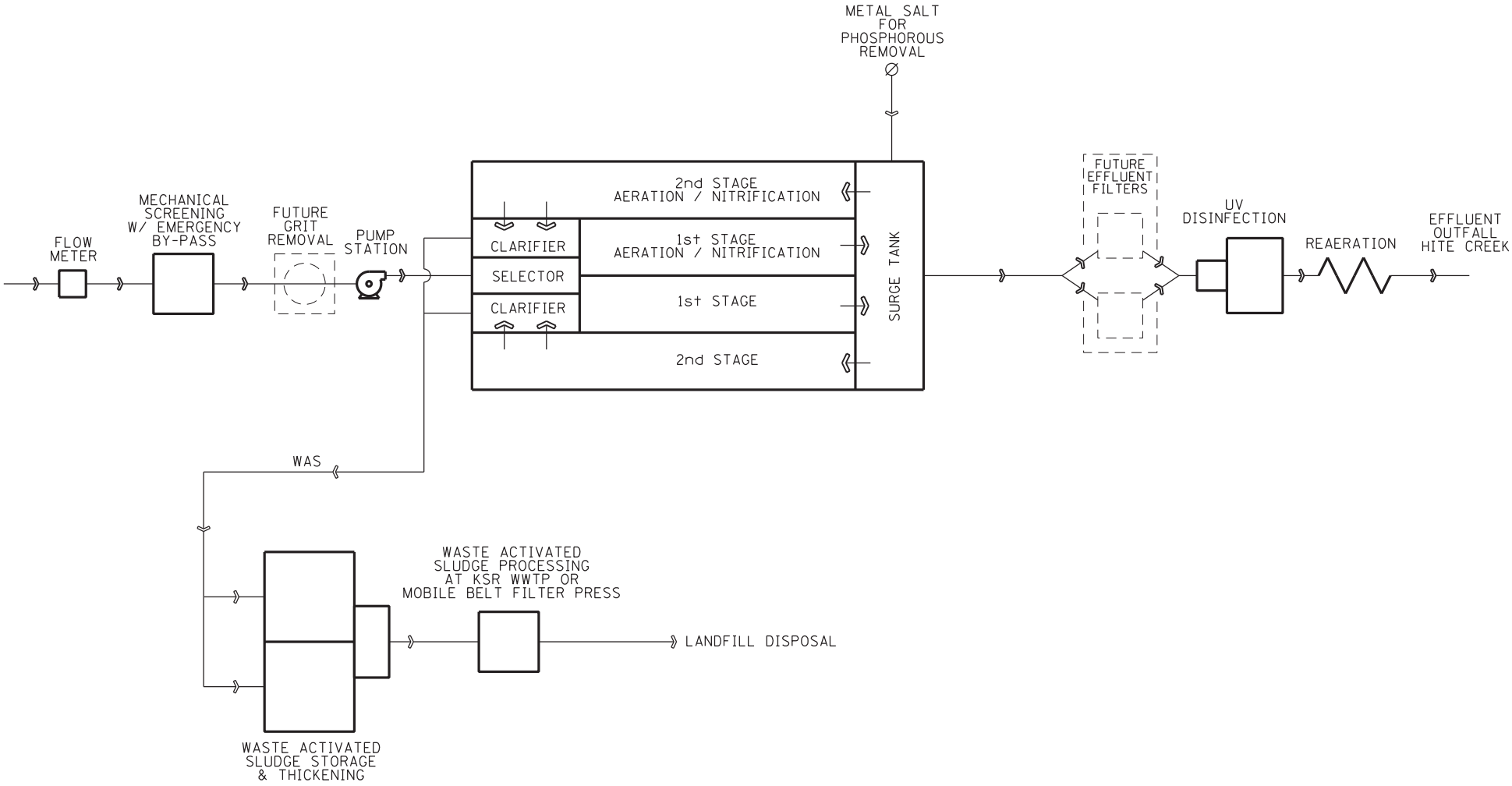

FIG 8-4

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SEQUENTIAL AERATION W/ CONTINUOUS CLARIFICATION PROCESS DIAGRAM
OLDHAM COUNTY ENVIRONMENTAL AUTHORITY
NEW REGIONAL WASTE WATER TREATMENT PLANT
OLDHAM COUNTY, KENTUCKY

HAGERTY CONSULTING, LLC. ENGINEERING PLANNING & MANAGEMENT

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sections.

- Headworks – The headworks consist of a flow meter, automatic, mechanically cleaned screen, with 0.25 inch opening, emergency by-pass channel with a 1 inch, manually cleaned bar rack. The peak flow capacity of each channel will be a minimum of 3.25 mgd.

- Grit Removal - The existing wastewater treatment plants have not had equipment operational of maintenance issues related to grit. The proposed treatment plant will not include grit removal, however the necessary headloss and spacing will be provided to allow future installation of a vortex type grit removal system.

- SEQUOX Reactor –Screened sewage enters the selector tank in which RAS is mixed with the sewage. The mixed liquor enters the continuously aerated first stage aeration basin where oxidation begins, the flow moves to the second stage aeration through the surge tank. Flow from the second stage aeration tank enters the final clarifier at a constant rate. The tanks water level will vary based on total plant flow. The aeration basins are sized based on 15 lbs./day/1000 cubic feet of reactor volume. The aeration system is sized based on an oxygen demand of 1.5 lbs. oxygen per lb. BOD removed and 4.6 lbs. oxygen per lb. ammonia removed. The oxidation ditches reactor volume is 1.09 million gallons. Air required for mixing and oxygen transfer is provided by two 80 horsepower positive displacement blowers.

- Secondary Clarifiers – Six 24 by 22-foot rectangular clarifiers, 16 foot side water depth with a surface area of 3,168 sq. ft. are included in the preliminary process configuration. The clarifiers liquid is based on the 10 State Standards, surface loading rate for extended aeration, single stage nitrification of 1000 gpd/day / sq. ft. and solids loading rates of 35 lbs./day/sq. At maximum day flow and RAS return rate, based on a MLSS concentration of 3400 mg/l. The average surface overflow rate is 400 gpm/day/sq. and with one unit out of service is 800 gpm/day/sq. ft. The weir overflow rate is 4,640 gpd/linear foot. All design parameters meet 10 State Standard Requirements and do not include flow equalization provided by the surge tank.

- Phosphorus Removal - Phosphorus removal will be accomplished by biological treatment using an anaerobic selector cycle to the batch process. Metal salt chemical system is provided for polishing of the effluent as required to meet the effluent standard of 1.0 mg/l. The anaerobic selector system has been designed to meet the peak hour flow rate at a influent phosphorus level of 6 mg/l. The metal salts will be delivered and stored in a 300 gallon tote.

- RAS/WAS System - RAS and WAS will be conveyed from the secondary clarifiers to selector or into the WAS storage basin by solids handling pumps. The RAS/WAS system will be a combined pumping system and will have dedicated flow meters to monitor return and wasted sludge rates and volumes. RAS and WAS rates will be automatically controlled by a motorized valve and total wasted sludge accumulating controller. The plant operator will control total gallons wasted by dialing in the RAS return rate and the desired WAS volume and flow rate into the controller. An estimated 19,000 gallons of WAS will be wasted at design capacity. The RAS controller will allow either influent flow paced RAS return or flow based (gpm) control.

- Final Filters - Space and hydraulics requirements to allow installation of final filters in the future will be provided to allow the facility to meet more stringent effluent standards in the future.

- Ultraviolet Disinfection and Dissolved Oxygen Content - The ultraviolet (UV) disinfection system

will be designed to transmit the 10 State Standard required dosage of 30,000 uW-s/cm. sq. (30mJcm. sq.) to meet an E. coli. Standard of 130 colonies per 100 milliliters year around and a weekly maximum of 240 colonies per 100 milliliters at peak flow rates. An in-channel UV system will be designed with a minimum of two channels. After UV disinfection,

- the plant effluent will be aerated to meet a DO standard of 7 mg/l.

- Flow Measurement - Final effluent flow measurement will be provided using a V-notched weir or open channel flow device.

- Operation Building - A combined electrical/control system and operations building will be provided. The building will be approximately 1200 sq. ft. and include an area for operating reports documentation, storage and process testing.

- WAS Sludge Processing – The WAS will be stored in two, 265,000 gallon, aerated sludge holding tank for processing and landfill disposal. The aerated sludge storage will be constructed with decant valves to allow thickening of the WAS. The aerated storage will provide approximately 45 days of storage volume based on a 2% sludge concentration. OCEA operates several regional and small package type wastewater treatment systems and several times a year schedules the use of a mobile belt filter press to dewater the sludge. The dewatered sludge is then transported to one of two landfills under contract to OCEA. In the warmer, dryer periods of the year, OCEA will transport the sludge to the KSR wastewater treatment plant, dry the liquid sludge on the existing sand drying beds and transport the dried sludge to the landfills for disposal.

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Sequencing Batch Reactor

The Sequential Batch Reactor Treatment System (SBR) is a single tank processing system that uses a time based sequence of process operations that is matched to the influent flow requirements. SBR technology has been used to provide treatment of industrial and municipal wastewater for over 25 years. There are over 30 operating systems in the Midwest. The advantages of SBR over conventional treatment processes include flexible operations, lower energy usage, compact footprint and peak day flow treatment capacity. The proposed system is a three tank SBR system to provide added reliability and treatment capacity in the event one system is off-line for cleaning or maintenance. The system sizing for this alternative includes capacity to provide phosphorus removal using an anaerobic cycle to promote luxury update of phosphorus by the mixed liquor. Chemical addition is provided to polish the final effluent as required to meet existing and future phosphorus effluent requirements. Aeration is provided by flexible membrane diffusers.

A schematic diagram of the treatment system is shown on Figure 8-5 and described in the following sections.

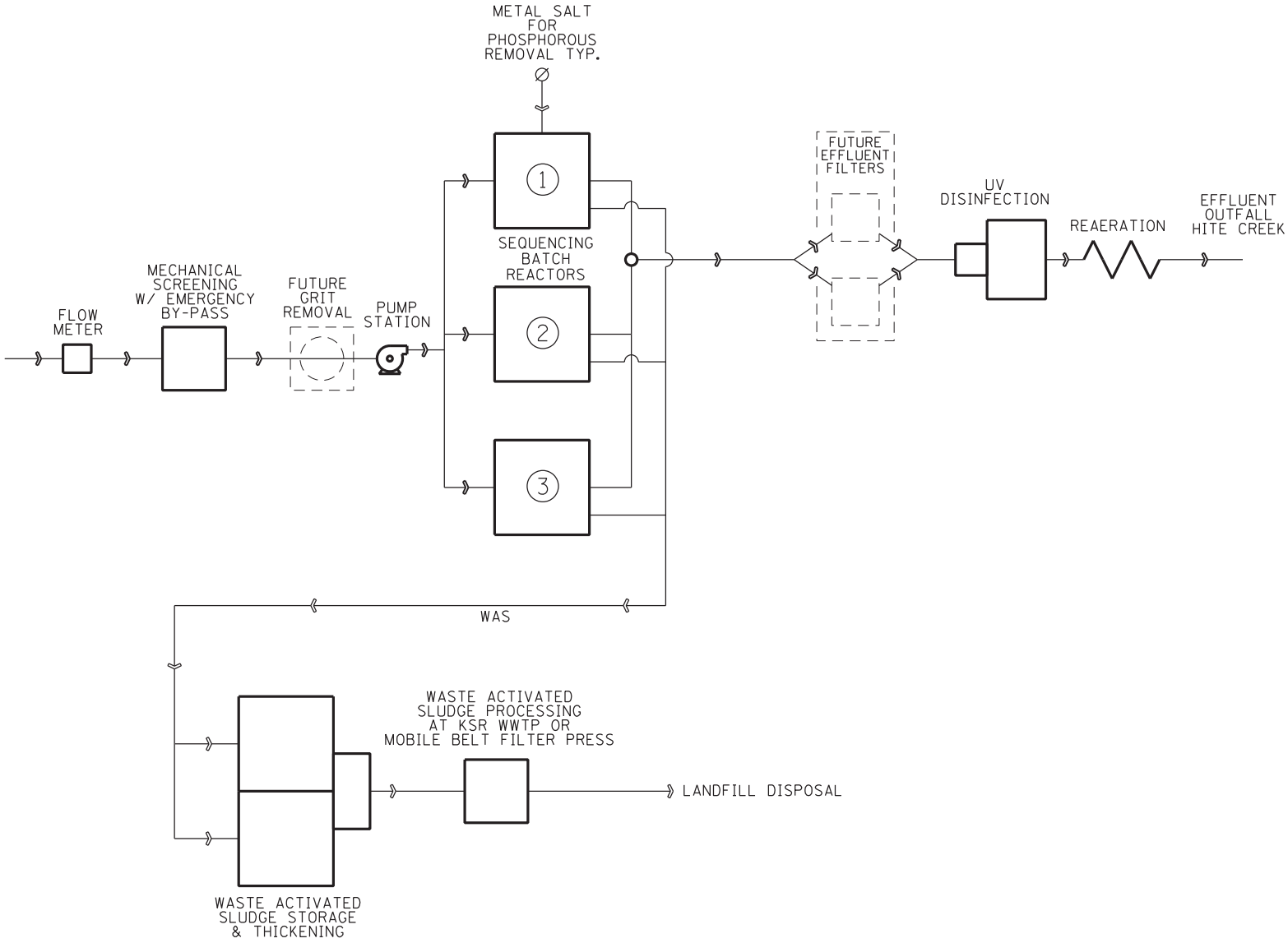
- Headworks – The headworks consist of a flow meter, automatic, mechanically cleaned screen, with 0.25 inch opening, emergency by-pass channel with a 1 inch, manually cleaned bar rack. The peak flow capacity of each channel will be a minimum of 3.25 mgd.

- Grit Removal - The existing wastewater treatment plants have not had equipment operational of maintenance issues related to grit. The proposed treatment plant will not include grit removal, however the necessary headloss and spacing will be provided to allow future installation of a vortex type grit removal system.

- SBR Reactor –Screened sewage enters one of three reactor tanks and is mixed with the RAS. The tanks water level will vary based on total plant flow and cycle requirements. The aeration basins are sized based on 15 lbs./day/1000 cubic feet of reactor volume at the minimum water level depth. The design F/M ratio is 0.1 lbs. BOD/lb. MLSs –day. The aeration system is sized based on an oxygen demand of 1.5 lbs. oxygen per lb. BOD removed and 4.6 lbs. oxygen per lb. ammonia removed. Air required for mixing and oxygen transfer is provided by two 80 horsepower positive displacement blowers.

- Phosphorus Removal - Phosphorus removal will be accomplished by biological treatment using an anaerobic selector cycle to the batch process. Metal salt chemical system is provided for polishing of the effluent as required to meet the effluent standard of 1.0 mg/l. The anaerobic selector system has been designed to meet the peak hour flow rate at a influent phosphorus level of 6 mg/l. The metal salts will be delivered and stored in a 300 gallon tote.

- RAS/WAS System - RAS and WAS will be conveyed from the secondary clarifiers to selector or into the WAS storage basin by solids handling pumps. The RAS/WAS system will be a combined pumping system and will have dedicated flow meters to monitor return and wasted sludge rates and volumes. RAS and WAS rates will be automatically controlled by a motorized valve and total wasted sludge accumulating controller. The plant operator will control total gallons wasted by dialing in the RAS return rate and the desired WAS volume and flow rate into the controller. An estimated 19,000 gallons of WAS will be wasted at design capacity. The RAS controller will allow either influent flow paced RAS return or flow based (gpm) control.



SEQUENTIAL BATCH REACTOR (SBR) - PROCESS FLOW DIAGRAM
OLDHAM COUNTY ENVIRONMENTAL AUTHORITY
NEW REGIONAL WASTE WATER TREATMENT PLANT
OLDHAM COUNTY, KENTUCKY

HAGERTY CONSULTING, LLC. ENGINEERING PLANNING & MANAGEMENT

Oldham County Environmental Authority

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Approved by: J. Hagerty
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FIG 8-5

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- Final Filters - Meeting an effluent phosphorus standard of 1.0 mg/l will not require the installation of final filters. Space and hydraulics requirements to allow installation of final filters in the future will be provided to allow the facility to meet more stringent effluent standards in the future.

- Ultraviolet Disinfection and Dissolved Oxygen Content - The ultraviolet (UV) disinfection system will be designed to transmit the 10 State Standard required dosage of 30,000 uW-s/cm. sq. (30mJcm. sq.) to meet an E. coli. Standard of 130 colonies per 100 millliliters year around and a weekly maximum of 240 colonies per 100 milliliters at peak flow rates. An in-channel UV system will be designed with a minimum of two channels. After UV disinfection, the plant effluent will be aerated to meet a DO standard of 7 mg/l. A post SRB equalization tank will be provided to allow the UV system to be operated at the design peak flow rates.

- Flow Measurement - Final effluent flow measurement will be provided using a V-notched weir or open channel flow device.

- Operation Building - A combined electrical/control system and operations building will be provided. The building will be approximately 1200 sq. ft. and include an area for operating reports documentation, storage and process testing.

- WAS Sludge Processing – The WAS will be stored in two, 265,000 gallon, aerated sludge holding tank for processing and landfill disposal. The aerated sludge storage will be constructed with decant valves to allow thickening of the WAS. The aerated storage will provide approximately 45 days of storage volume based on a 2% sludge concentration. OCEA operates several regional and small package type wastewater treatment systems and several times a year schedules the use of a mobile belt filter press to dewater the sludge. The dewatered sludge is then transported to one of two landfills under contract to OCEA. In the warmer, dryer periods of the year, OCEA will transport the sludge to the KSR wastewater treatment plant, dry the liquid sludge on the existing sand drying beds and transport the dried sludge to the landfills for disposal.

Estimates of Probable Construction and Operating Costs for the Treatment System Alternatives

Estimates of probable capital and operating costs for the three treatment system were compiled based on information provided by equipment suppliers; estimated structural cast- in-place concrete costs and building costs; recent bid tabs for pump station construction costs; operating requirements; and assumed mark-ups for taxes, mobilization, insurance, risk and contractor overhead and profit. Process and equipment sizing was provided by process equipment suppliers for the major treatment components; including the biological system, UV and aeration system components. The following tables provide the capital, operating costs and present worth costs for the three treatment plant alternatives considered.

Table 8-4: Treatment Alternative 1

Present Worth Project Cost Estimate Continuous Loop Reactor (Oxidation Ditch) Wastewater Treatment Plant Oldham County Environmental Authority		
Headworks Screen w/ Emergency By-Pass Channel		$ 337,500
New Screened Effluent Pump Station		$ 200,000
Continuous Loop Reactor		$ 1,924,242
Chemical Feed System - Phosphorous Removal		$ 277,000
Final Clarifier Flow Splitter Box		$ 75,400
Final Clarifiers, Scum and RAS/WAS Pump Station		$ 805,994
UV Disinfection and Reaeration System		$ 401,500
Aerated Sludge Storage		$ 680,000
Effluent Outfall		$ 225,000
Plant Water System and Plant Site Pump Station		$ 235,000
Electric/Control Building		$ 420,000
Subtotal Costs		$ 5,581,635
Electrical/Instrumentation		$ 361,314
Equipment Installation		$ 412,931
Taxes		$ 103,233
Site Work Piping and Miscellaneous Piping		$ 361,314
Contractor Bonds, Risk, OH & Profit	18%	$ 929,094
Subtotal		$ 7,749,522
Contingency	10%	$ 774,952
Estimated Total Construction Costs		$ 8,524,475
Professional Development Costs (20%)		$ 1,704,895
Legal, Administration and Specialty Services (5%)		$ 426,224
Land Costs		$ 500,000
Total Project Costs		$ 11,155,593
Salvage Value - Structures Only		$ 2,754,635
Operations and Maintenance Costs		
Labor		$ 175,000
Power and Chemicals		$ 143,000
Material, Supplies and Insurance		$ 71,500
Solids Processing		$ 35,000
Annual Operating Costs - Year 1 @ 847,000 gpd		$ 424,500
Annual Operating Costs - Year 1 per 1000 Gallons Treated		$ 1.37
Total Operating and Maintenance Costs		$ 424,500
Present Worth Costs - 20 years @7%		
Salvage Value		$ 711,798
Operating and Maintenance		$ 17,402,586
Net Present Worth Costs - 20 years @7%		$ 27,846,381

*O&M Present Worth Calculation provided by DOW

Table 8-5: Treatment Alternative 2

Present Worth Project Cost Estimate Sequential Batch Reactor with Continuous Clarifier Wastewater Treatment Plant Oldham County Environmental Authority			
Headworks Screen w/ Emergency By-Pass Channel		$	337,500
New Screened Effluent Pump Station		$	260,000
Sequox-Plus System Aeration and Clarifier System		$	2,125,000
Chemical Feed System - Phosphorous Removal		$	277,000
UV Disinfection and Reaeration System		$	401,500
Aerated Sludge Storage		$	815,000
Effluent Outfall		$	225,000
Plant Water System and Plant Site Pump Station		$	235,000
Electric/Control Building		$	420,000
Subtotal Costs		$	5,096,000
Electrical/Instrumentation		$	233,800
Equipment Installation		$	374,080
Taxes		$	93,520
Site Work Piping and Miscellaneous Piping		$	233,800
Contractor Bonds, Risk, OH & Profit	18%	$	841,680
Subtotal		$	6,872,880
Contingency	10%	$	687,288
Total Costs		$	7,560,168
Professional Development Costs (20%)		$	1,512,034
Legal, Administration and Specialty Services (5%)		$	378,008
Land Costs		$	500,000
Total Project Costs		$	9,950,210
Salvage Value - Structures Only		$	2,699,000
Operations and Maintenance Costs			
Labor		$	200,000
Power and Chemicals		$	103,000
Material, Supplies and Insurance		$	51,500
Solids Processing		$	38,000
Annual Operating Costs - Year 1 @ 847,000 gpd		$	392,500
Annual Operating Costs - Year 1 per 1000 gallons Treated		$	1.27
Total Operating and Maintenance Costs		$	392,500
Present Worth Costs - 20 years @7%			
Salvage Value		$	697,422
Operating and Maintenance		$	16,090,731
Net Present Worth Costs - 20 years @7%		$	25,343,519

*O&M Present Worth Calculation provided by DOW

Table 8-6: Treatment Alternative 3

Present Worth Project Cost Estimate Sequential Batch Reactor Wastewater Treatment Plant Oldham County Environmental Authority		
Headworks Screen w/ Emergency By-Pass Channel		$ 337,500
New Screened Effluent Pump Station		$ 260,000
SBR System		$ 2,241,004
Chemical Feed System - Phosphorous Removal		$ 277,000
UV Disinfection and Reaeration System		$ 401,500
Aerated Sludge Storage		$ 815,000
Effluent Outfall		$ 225,000
Plant Water System and Plant Site Pump Station		$ 235,000
Electric/Control Building		$ 420,000
Subtotal Costs		$ 5,212,004
Electrical/Instrumentation		$ 239,600
Equipment Installation		$ 383,360
Taxes		$ 95,840
Site Work Piping and Miscellaneous Piping		$ 239,600
Contractor Bonds, Risk, OH & Profit	18%	$ 862,561
Subtotal		$ 7,032,965
Contingency	10%	$ 703,297
Estimated Total Construction Costs		$ 7,736,262
Professional Development Costs (20%)		$ 1,547,252
Legal, Administration and Specialty Services (5%)		$ 386,813
Land Costs		$ 500,000
Total Project Costs		$ 10,170,327
Salvage Value - Structures Only		$ 2,235,523
Operations and Maintenance Costs		
Labor		$ 200,000
Power and Chemicals		$ 103,000
Material, Supplies and Insurance		$ 51,500
Solids Processing		$ 38,000
Annual Operating Costs - Year 1 @ 847,000 gpd		$ 392,500
Annual Operating Costs - Year 1 per 1000 Gallons Treated		$ 1.27
Total Operating and Maintenance Costs		$ 392,500
Present Worth Costs - 20 years @7%		
Salvage Value		$ 577,659
Operating and Maintenance		$ 16,090,731
Net Present Worth Costs - 20 years @7%		$ 25,683,399

*O&M Present Worth Calculation provided by DOW

The estimated construction costs for the Sequox and SBR systems are less than 3% difference and are considered equal alternatives. The Sequox and SBR systems are approximately 12% lower to construct then oxidation ditch system.

The operating costs of the Sequox and SBR systems are considered equal since they both use high efficient fine bubble aeration systems and can tailor energy use to flow. These processes have been configured to remove phosphorus using biological treatment and effluent polishing using metal salts. The oxidation ditch process relies on metal salts for all phosphorus removal and has a greater energy requirement to maintain the oxidation ditch process when operating at low flows.

Table 8-7
Summary of Estimated Costs
Wastewater Treatment System Alternatives
Crestwood and South Floyds Fork Service Areas
Oldham County, Kentucky

Alternative	Oxidation Ditch	Sequox	SBR
Construction w/contingency	$8,524,475	$7,560,168	$7,736,262
Development	2,131,119	1,890,042	1,934,065
Land	500,000	500,000	500,000
Total Capital Costs	$11,155,594	$9,950,210	$10,170,327
Annual O&M	424,500	392,500	392,500
Salvage Value	2,754,635	2,699,000	2,235,523
Net Present Worth	$27,846,382	$25,343,519	$25,683,399

Selected Treatment Alternative

Based on the evaluation of treatment alternatives, using both monetary and nonmonetary criteria, the selected alternative is the Sequential Batch Reactor system. The SBR system construction and operational costs is equivalent to the lowest cost alternative. SBR systems have a good track record of demonstrated performance in Kentucky and throughout the Midwest. The SBR plant will be sized to receive flow from both the Crestwood and South Floyds Fork Service Areas; eliminating all package treatment plants in these areas.

- Demonstrated Performance – The treatment process should have a demonstrated performance of a minimum of five treatment plants of similar or larger capacity for a period of five to ten years of continuous operation. The SBR system have operating facilities of 1.25 mgd and greater that have been in continuous operations in the Midwest for 5 to 10 years.

- Meet water quality standards of the Waste Load Allocation – All three systems can meet

established water quality standards. The SBR system includes biological phosphorus removal. The oxidation ditch can also provide biological phosphorus removal but adding that process would increase capital costs.

- Provide capacity for continued growth in the Service Areas – All three systems can be expanded to provide additional capacity in the future. The oxidation ditch system and Sequox process costs for adding new capacity is greater due to process configuration.

- Flexibility for modification for future water quality standards - Final filters would be required to meet more stringent phosphorus standards for any of the proposed treatment processes. Removal of total nitrogen can be accomplished in the SBR system by modifying the operating sequence and adding an additional reactor. The Sequox and oxidations ditch processes would require additional tankage, mixers and internal recirculation systems to accomplish nitrogen removal.

- Consistent with existing treatment plant operations and staff training - OCEA operates an oxidation ditch system at the KSR facility and is more familiar with this system. However, there are multiple SBR systems in operations in Kentucky and southern Indiana providing OCEA staff support in establishing operating producers.

Present Worth Analysis of the New Orchard Grass Regional WWTP Alternative

This present worth analysis is based on constructing a new 1.25 mgd, tertiary treatment, Sequential Batch Reactor Regional WWTP in the Crestwood Service Area. The treatment plant will be sized to treat flows from the Crestwood and South Floyds Fork Service Areas. An integrated conveyance system would be constructed to convey flow from the South Floyds Fork Service Area to the new regional WWTP in the vicinity of Hite Creek. Figure 8-2 presents the infrastructure requirements for this alternative.

Table 8-8: Combined Alternative 2: Construction of New OCEA Orchard Grass Regional WWTP

Facilities	Quantity	Unit	Unit Costs ($)	Estimated Costs
Orchard Grass Regional WWTP				
WWTP	1.25 mgd			$10,170,327
Subtotal				**$10,170,327**
Pump Stations				
Orchard Grass	1,15	mgd	$315,000	$315,000
Ash Avenue	0.65	mgd	$257,250	$257,250
Friendship Manor	0.10	mgd	$115,500	$115,500
Institute for Women	0.14	mgd	$147,000	$147,000
Restoration, Telemetry, Special Fittings (15%)				$125,213
Subtotal				**$959,963**
Gravity Sewers				
12-inch	800	LF	$56.70	$45,360
15-inch	5,060	LF	$60.90	$308,154
Restoration, Street Repairs & Special Fittings (15%)				$53,027
Subtotal				**$406,541**
Forcemains				
6-inch	4,030	LF	$47.25	$190,418
10-inch, In Roadway	3,090	LF	$78.75	$243,338
12-inch	19,630	LF	$78.75	$1,545,863
12-inch, in Roadway	7,615	LF	$94.50	$719,618
Jack and Bore	770	LF	$630.00	$485,100
Restoration, Street Repairs & Special Fittings (15%)				$404,885
Subtotal				**$3,589,222**
Conveyance System Development Costs				
Easements	40,995	LF	$6.30	$258,269
Legal, Administration & Specialty Services (10%)				$495,573
Contingencies and Technical Services (25%)				$1,238,932
Estimated Collection System Capital Costs				**$6,690,230**
Average Annual O&M Costs				
Pumping Station and Conveyance				$328,260
Treatment and Capacity Fees				$392,500
Total Average Annual O&M Costs				**$720,760**
Present Worth of O&M Costs (@7%)				**$29,547,911**
Total Present Worth Costs – Hite Creek WQTC Alternative				**$46,408,468**

O&M costs and Present Worth Calculations provided by DOW

Summary and Review of Combined Alternatives for the Crestwood and South Floyds Fork Service Areas

In the next sections the projected capital and operations and maintenance costs, present worth analysis and non-monetary review of the two combined alternatives are summarized, evaluated and the recommended alternative presented. The two combined alternatives, their respective costs and non-monetary evaluation has been presented to OCEA Board for review and concurrence.

Summary and Comparison of Costs

The estimated capital, annual operation and maintenance, and the 20-year present worth costs are presented in Table 8- 9 for the two combined alternatives.

The annual O&M costs for each alternative are based on an estimate of manpower, electricity, equipment repair/replacement, and consumables. These annual costs are converted into annual cost in current dollars based on an interest rate of 7%. A 7% rate has been used based on DOW requirements for this facility plan. OCEA provided their engineer's analysis of O&M and present worth costs to the DOW and MSD. DOW reviewed these costs and provided to OCEA the annual O&M costs and present worth analysis they deemed appropriate for the alternatives. DOW annual O&M costs and present worth values have been used in OCEA analysis of alternatives.

Table 8-9
20 Year Present Worth Costs of Combined Alternatives
Oldham County, Kentucky

Alternative	Combined Alt 1 – MSD Hite Creek WQTC	Combined Alt 2 – OCEA Regional WWTP
WWTP	$0.0[1]	$10,170,327
Collection System	$7,654,452	$6,690,230
Total Capital Costs	$7,654,452	$16,860,557
Annual O&M	$1,175,049	$720,760
Annual O&M Present Worth	$48,171,712	$29,547,911
Total Present Worth	$55,826,164	$46,408,468

1. Capital Costs for OCEA's share of the new treatment plant construction are included in MSD's treatment costs which are represented in the Annual O&M costs.

Alternative 2**:** Construction of a New Orchard Grass Regional WWTP present worth costs is estimated to save OCEA $9.4 million in present worth cost (in 2013 dollars) over implementing Alternative 1 MSD Hite Creek WQTC. This is an annual savings (in 2013 dollars) over the 20-year analysis period of $0.47 million per year or approximately $150 per year for each OCEA customer.

Evaluation of Nonmonetary Factors

Nonmonetary analysis is used to evaluate and quantify an alternative's relationship to established community, governmental and environmental goals. The criteria included:

- *Environmental Impact*- Short and long term impact on the environment, including items such as water quality, flora and fauna, air quality and others.
- *Public Acceptance* - A measure of public acceptance of the project and support of existing land use codes.
- *Constructability*- Ease of the alternative to be permitted, designed, and constructed.
- *Operation Evaluation (Reliability and Operability)* - A judgment of reliability, maintenance and operation issues related to operations of the alternative.
- *Energy Use* - Energy conservation, a measure of energy consumption associated with the proposed facilities.
- *Infrastructure Compatibility*- Flexibility to adapt to changing conditions and compatibility with other infrastructure priorities such as waterline extensions, septic tank elimination, and other utility improvements.

These criteria are the basis for establishing a quantitative score for each alternative. A numerical ranking of 1 or 2 was given to each alternative in the order of least favorable (1) to most favorable (2). The alternative with the highest point score is considered the most favorable alternative. The alternative ranking is a relative ranking between the two alternatives.

Each criterion is assigned a "weight factor" to rank the relative importance of the criterion to OCEA. A total weight factor of 100 points was distributed to the criteria. The score of each alternative is calculated by multiplying the criteria ranking by the weight factor and adding the total score for each alternative. The nonmonetary analyses for the alternatives are presented in Table 8-10 below.

Table 8-10
Nonmonetary Analysis
Crestwood and South Floyds Fork Service Areas
Oldham County, Kentucky

Criteria	Weight Factor	Combined Alt 1 – MSD Hite Creek WQTC		Combined Alt 2 – OCEA Regional WWTP	
		Ranking	Weighted Points	Ranking	Weighted Points
Environmental Impact	20	2	40	2	40
Public Acceptance	10	1	10	2	20
Constructability	20	2	40	2	40
Operation Evaluation	12	2	24	2	24
Energy Usage	8	2	16	2	16
Infrastructure Compatibility	30	1	30	2	60
Total Weighted Score	100		160		200

The Alternative 2 – OCEA Regional WWTP is the most favorable alternative and outscored the Alternative 1 – MSD Hite Creek WQTC by a score of 200 to 160. The basis for the Non-Economic Factors scoring is discussed in the following sections.

Environmental Impacts

Both alternatives eliminate OCEA's treatment plants in the South Floyds Fork Service Area and the Institute for Women WWTP; eliminating several outfalls in the Floyds Fork Watershed. These alternatives regionalize treatment in a new regional tertiary treatment plant and there is no added benefit from implementing either alternative, so they were considered equal.

Public Acceptance

The Combined Alt 2 – OCEA Regional WWTP was assigned a higher ranking due to the significantly lower cost of this alternative. Implementing a higher cost alternative is normally not well received by the public, in the absence of other mitigating factors. While there will be opposition to the new conveyance system from the South Floyds Fork Service Area to the new regional treatment plant in the Crestwood Area; consolidating treatment in regional facilities, eliminating existing package treatment plants in the impaired Floyds Fork Watershed should receive public and regulatory support.

Constructability

Both alternatives require the construction of new treatment plant; therefor each alternative was considered equal. OCEA has received a preliminary Waste Load Allocation (WLA) from DOW for a new discharge to Hite Creek with the same effluent discharge standards that MSD will have to meet with the construction of their new treatment systems.

Operation Evaluation and Energy Use

Both alternatives will be designed to meet established reliability standards and neither alternative has a discernible advantage over the other from the standpoint of operational or energy usage. The MSD Hite Creek WQTC alternative may require additional power to deliver the flow to the new treatment plant but this added cost is not considered sufficient to lower the ranking of this alternative. The recommended treatment process for the OCEA's Regional Treatment Plant is a high efficient system that will utilize a high efficient fine bubble aeration system.

Infrastructure Compatibility

The Combined Alt 2 – OCEA Regional WWTP is considered the most favorable alternative and has the flexibility to adapt to changing conditions in the service areas without negotiations with a third party. This alternative constructs a conveyance system through areas that have a significant number of existing package type treatment systems and will be sized to allow these systems to connect. The new sewage conveyance system will have the flexibility to accommodate land use planning and zoning of Oldham County.

Recommended Alternative

Based on the monetary and nonmonetary evaluations, Alternative 2 – OCEA Regional WWTP is the recommended alternative. Construction of a new regional treatment plant in the vicinity of Hite Creek and a regional force main system interconnecting the two service areas to the new plant will be required. There are several potential treatment plant sites in the vicinity of Hite Creek that are suitable for construction of a new regional WWTP. The benefits of this alternative are:

- Lowest cost solution for providing wastewater services to the Crestwood and South Floyds Fork Service Areas;
- Eliminates existing package treatment plants in the South Floyds Fork Service Area from discharging to the Floyds Fork watershed;
- Provides sewage conveyance and treatment capacity to support new developments in the service areas;
- Increases OCEA's customer base by allowing existing residents and commercial facilities with on-site systems access to the regional system and adds the Institute for Women; and
- Meets the conditions established in the Division of Water (DOW) Preliminary Waste Load Allocations Conditions.

Pump Station, Force Main, and Interceptor Sewer Upgrades

The Integrated System Alternative figure shows a preliminary force main alignment for providing conveyance of the wastewater to a proposed location for the new regional wastewater treatment plant in the Crestwood Service Area. The route has been conceptually developed to allow existing package treatment plants to be connected to the system. The force main alignment is for preliminary planning purposes and additional evaluations will be required to complete easement acquisition, right-of way use permitting, design, and construction.

The recommended plan proposes new pump stations at several locations and at existing wastewater treatment plants. Table 8-11 provides a list of pump station locations and required 20-year plan, average day flow capacity. The pump station will be designed to eliminate overflows and will be provided with connections for emergency power supply generators. The peak capacity of each pump station will be based on evaluation of flow meter data and determination of required peak flow rates per *Ten-States Standards*; the highest required peak flow rate will be used for the design.

Table 8-11
Pump Station Locations and Capacities
Crestwood and South Floyds Fork Service Areas
Oldham County, Kentucky

Pump Station Location	Average Daily Flow Capacity (gpd)
Ash Avenue	650,000
Institute for Women	140,000
Orchard Grass	1,150,000
Friendship Manor	17,000
Floydsburg	150,000
Country Village	40,000

Section 9 – Cross Cutter Correspondence and Mitigation

United States Fish and Wildlife Service Review

A letter was sent to the United States Fish and Wildlife Service (USFWS) on October 8, 2012, requesting a review of the significant concerns for local fish and wildlife resources or habitat with the proposed projects. The letter of response was received on November 13, 2012. All comments have been taken under advisement in the Site Acquisition process. A copy of the letter received from the USFWS is included in Appendix 1-11.

Kentucky Department of Fish and Wildlife Resource Review

A letter was sent to the Kentucky Department of Fish and Wild life Resources (KDFWR) on October 8, 2012, requesting a review of the significant concerns for local fish and wildlife resources or habitat with the proposed projects. The letter of response was received on November 8, 2012. The letter states that KDFWR does not anticipate any impacts on any federally listed or state listed threatened/endangered species. A copy of the letter received from the KDFWR is included in Appendix 1-11.

Kentucky Heritage Council Review

A letter was sent to the Kentucky Heritage Council (KHC) on October 8, 2012, requesting a review of the significant cultural or historical concerns with the proposed projects. A copy of the letter sent to the KHC is included in Appendix 1-11.

United States Army Corps of Engineers Review

A letter was sent to the United States Army Corps of Engineer (USACE) on October 8, 2012, requesting a review of the significant concerns for wetlands and other jurisdictional interests for the proposed projects. The letter of response was received on November 19, 2012. The letter states that the request is not an action usually completed by the Louisville District U.S. Army Corps of Engineers. A copy of the letter received from the USACE is included in Appendix 1-11.

Natural Resource Conservation Service Review

A letter was sent to the Natural Resource Conservation Service (NRCS) on October 8, 2012, requesting its review of significant concerns over agricultural resources as a result of the recommended plan. The letter of response was received on November 27, 2012. The letter states that all pipelines are within previously disturbed areas and therefore are not impacting prime farmland. The treatment facility site is to be reviewed in a separate determination upon site acquisition. A copy of the letter received from NRCS is included in Appendix 1-11.

Kentucky Clearinghouse Review

In addition to the agencies listed above, the KDOW will prepare a State Planning and Environmental Assessment Report (SPEAR) that is distributed to the following agencies:

Kentucky Department of Public Health
Kentucky Division for Air Quality
Kentucky Division of Forestry
Kentucky Division of Waste Management
Kentucky Division of Waste Water
Kentucky State Clearinghouse
Kentucky Geological Survey

Comments received from these agencies will be considered in approval of the RFP.

Section 10 – Recommended Regional Facility Plan

Recommended Plan

The New Regional WWTP Alternative is the recommended plan for regionalizing wastewater treatment and disposal for the Crestwood and South Floyds Fork Planning Areas. Financing, land and easement acquisition, design, permitting and construction of this alternative will have to be phased over several years. The recommended phasing, schedule and costs are discussed next.

Phase 1 – Construction of the Regional Wastewater Treatment Plant and Elimination of the Willow Creek and Orchard Grass Facilities

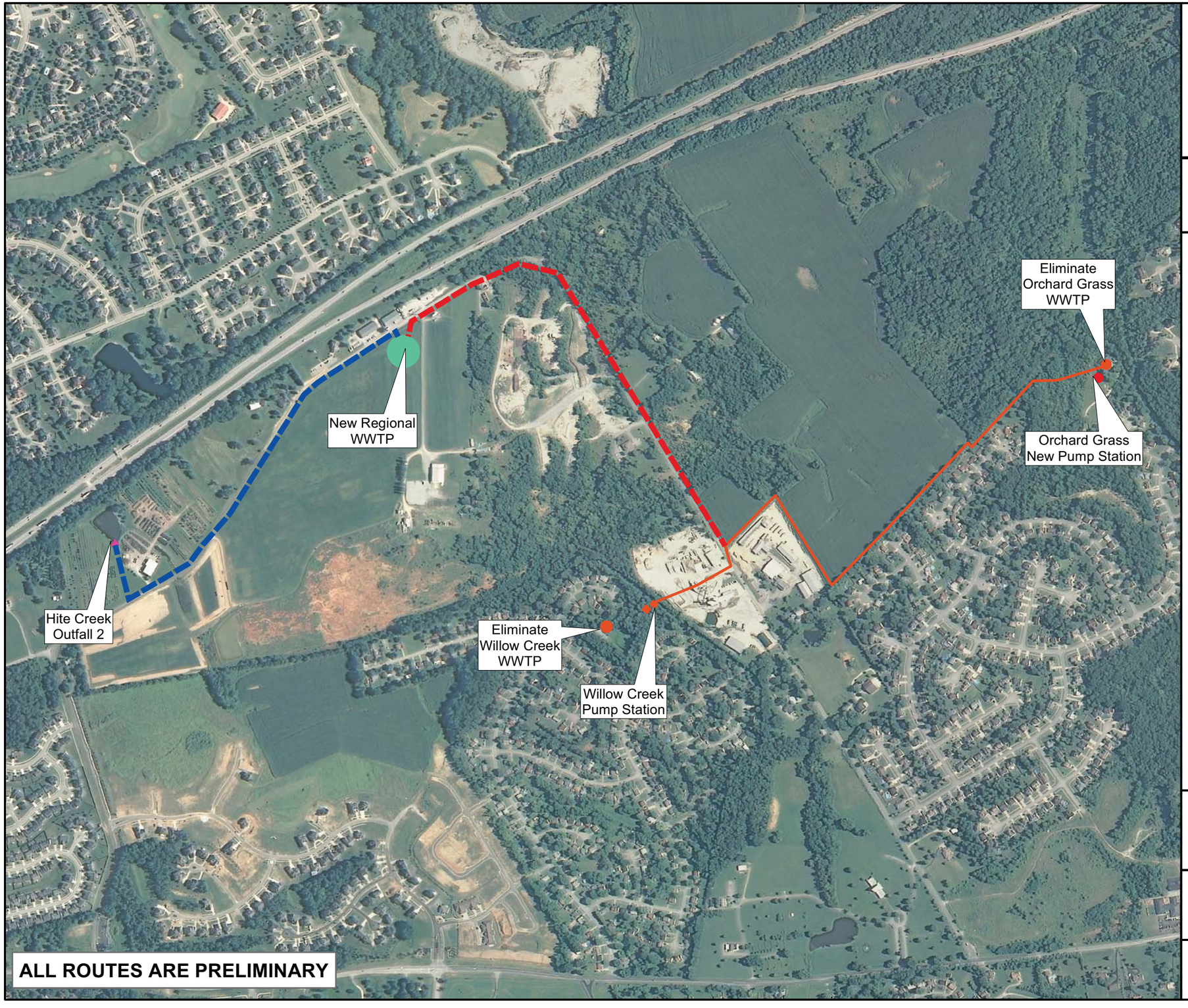
The first phase of the program includes construction of the new regional wastewater treatment plant and decommissioning the Willow Creek and Orchard Grass facilities. The existing tankage at the WWTPs may be converted to peak flow storage as necessary to buffer wet weather flows and reduce construction and operating costs.

Figure 10-1 shows the facilities required to complete this phase of the program. The preliminary estimate of probable costs for this phase of the project is approximately $11.6 million and includes the cost components shown below in Table 10-1.

Phase 1 – Program Elements	Estimated Costs
1.25 MGD New Regional WWTP	$ 10,170,000
Orchard Grass Pump Station and Conveyance Systems	$ 933,000
Easement and WWTP Site Acquisition	$ 541,000
Phase 1 - Estimated Probable Program Costs	$11,644,000

Table 10-1: Phase 1 Probable Program Costs

Once the Regional Facility Plan is approved, OCEA can begin implementing their financing plan and proceed with site and easement acquisition, design and permitting, bidding and construction activities.



OCEA

Regional Wastewater Facility Plan

Crestwood & South Floyds Fork Planning Area

Legend

- FLOYDS FORK ALT 4 SEWER MAIN Phase 1
- EXISTING SEWER MAINS
- Hite Creek Outfall 2 Sewer Main
- Crestwood New Regional WWTP
- Hite Creek New Outfall 2
- Orchard Grass Pump Station
- WWTPs

N

0 750 1,500 Feet

Oldham County Environmental Authority

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Figure 10-1
New Regional WWTP
Phase 1 Implementation

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Phase 2 – Construction of the Regional Sewer Forcemain and Elimination of the Ash Avenue and Institute for Women's WWTPs

Phase 2 of the program includes construction of the regional forcemain system, new pump stations at the Ash Avenue and Institute for Women's WWTPs and decommissioning the existing WWTPs. The existing tankage at the WWTPs may be converted to peak flow storage if necessary to buffer wet weather flows and reduced construction and operating costs.

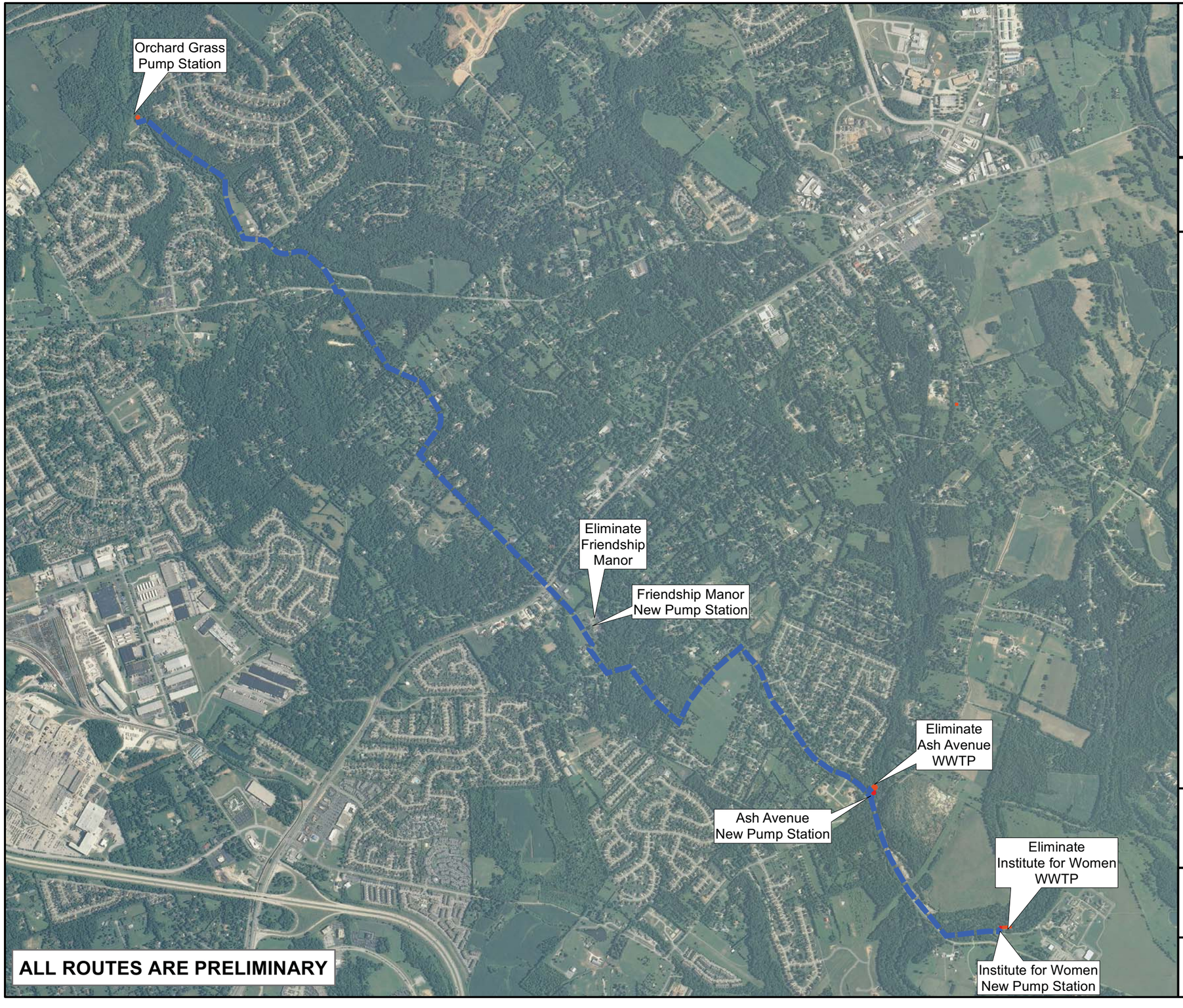
Figure 10-2 shows the facilities required to complete this phase of the program. The preliminary estimate of probable costs for this phase of the project is approximately $4.7 million and includes the cost components shown in Table 10-2.

Phase 2 – Program Elements	Estimated Costs
Institute For Women Facility Pump Station / Forcemain	$ 455,500
Ash Avenue Pump Station	$ 347,000
Friendship Manor Pump Station	$ 156,000
Ash to Orchard Grass Forcemain	$3,484,500
Easement Acquisition	$ 232,000
Phase 2 - Estimated Probable Program Costs	$4,675,000

Table 10-2: Phase 2 Probable Program Costs

Phase 3 – Extending the Gravity Collection System to Eliminate the Cherrywood Apartment WWTP

Phase 3 of the program constructs the infrastructure to extend the Ash Avenue collection system north to the Cherrywood apartment complex. Extension of the collection system north will provide regional wastewater services to existing residential and commercial properties and allow the Cherrywood Apartment's temporary/package treatment plant to be connected to the regional system and decommissioned. This will allow about 4,000 gallons per day to be treated at the Regional Wastewater Treatment Facility.



OCEA

Regional Wastewater Facility Plan

Crestwood & South Floyds Fork Planning Area

Legend

- FLOYDS FORK ALT 4 SEWER MAIN Phase 2
- Institute for Women Pump Station
- Ash Ave Pump Station
- WWTPs

Oldham County Environmental Authority operated by Veolia

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Figure 10-2
New Regional WWTP
Phase 2 Implementation

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Figure 10-3 shows the facilities required to complete this phase of the program. The preliminary estimate of probable costs for this phase of the project is approximately $503,000 and includes the cost components shown in Table 10-3.

Phase 3 – Program Elements	Estimated Costs
Ash Avenue Gravity Collection System Extension	$ 455,000
Easement Acquisition	$ 48,000
Phase 3 - Estimated Probable Program Costs	$ 503,000

Table 10-3: Phase 3 Probable Program Costs

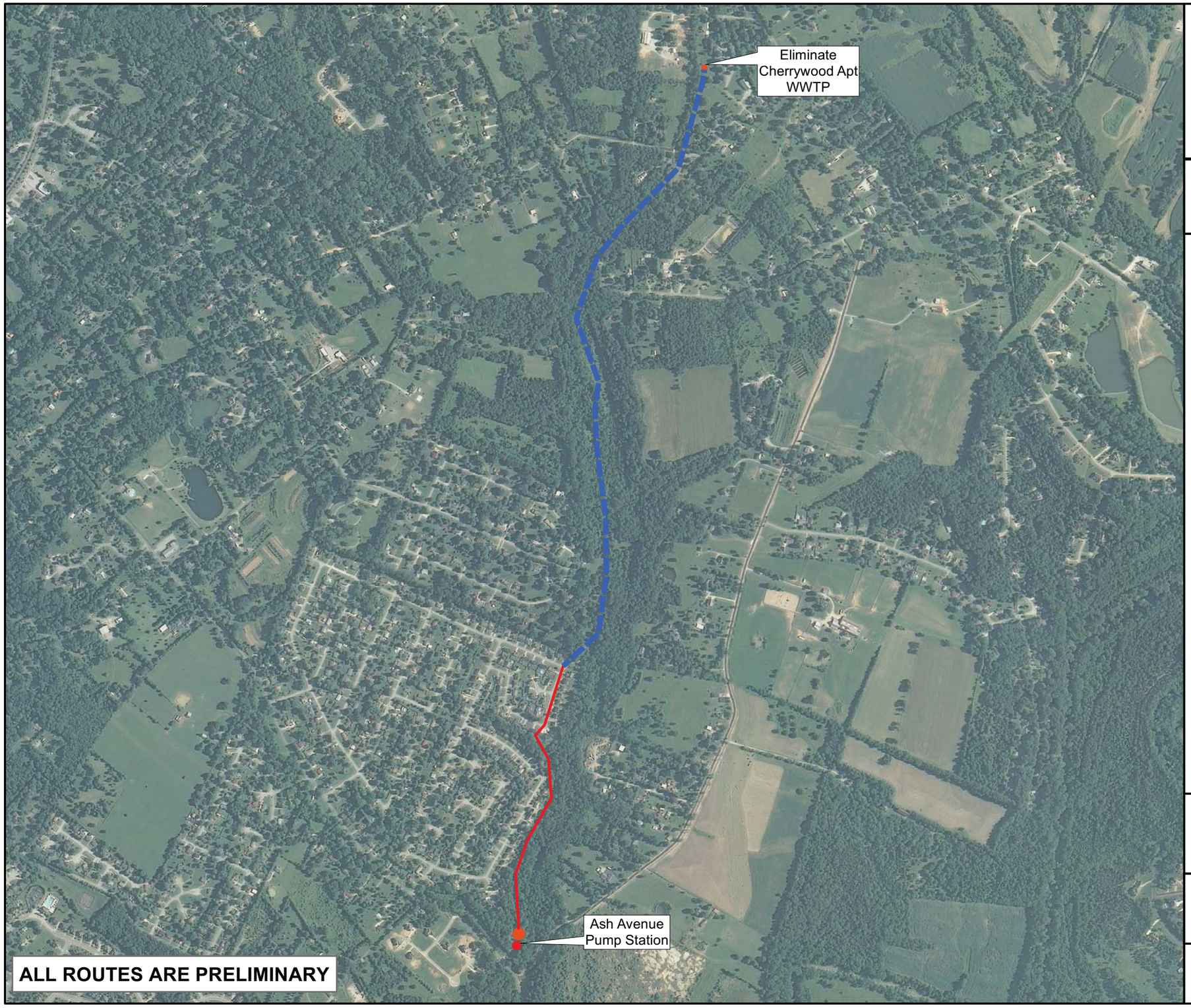
Phase 4 - Extending the Gravity Collection System to the Country Village WWTP

Phase 4 of the program will construct the infrastructure required to extend the Ash Avenue gravity collection to the Country Village subdivision. Extension of the collection system north will provide regional wastewater services to existing residential and commercial properties and allow the Country Village 40,000 gallons per day temporary/package treatment plant to be connected to the regional system and decommissioned. A new pump station at Floydsburg Road will be required to pump the Country Village gravity collection system to the Cherrywood Apartment Complex gravity system and approximately 1300 feet forcemain system constructed along Todds Point Road.

Figure 10-4 shows the facilities required to complete this phase of the program. The preliminary estimate of probable costs for this phase of the project is approximately $2.5 million and includes the cost components shown in Table 10-4.

Future Phases - Extension of the Gravity Collection System for Existing Septic Tank Service Area

The final phase of the program would construct the gravity collection system north and provide regional wastewater service to areas currently served by existing septic tanks. The infrastructure constructed should be designed to allow the system to accommodate the estimated 1.0 mgd of wastewater from the septic tank areas. No schedule has been identified for construction of this phase of the regional wastewater system.



OCEA

Regional Wastewater Facility Plan

Crestwood & South Floyds Fork Planning Area

Legend

- FLOYDS FORK ALT 4 SEWER MAIN Phase 3
- EXISTING SEWER MAINS
- Ash Ave Pump Station
- WWTPs

N

0 900 1,800

Feet

Oldham County Environmental Authority

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Figure 10-3
New Regional WWTP
Phase 3 Implementation

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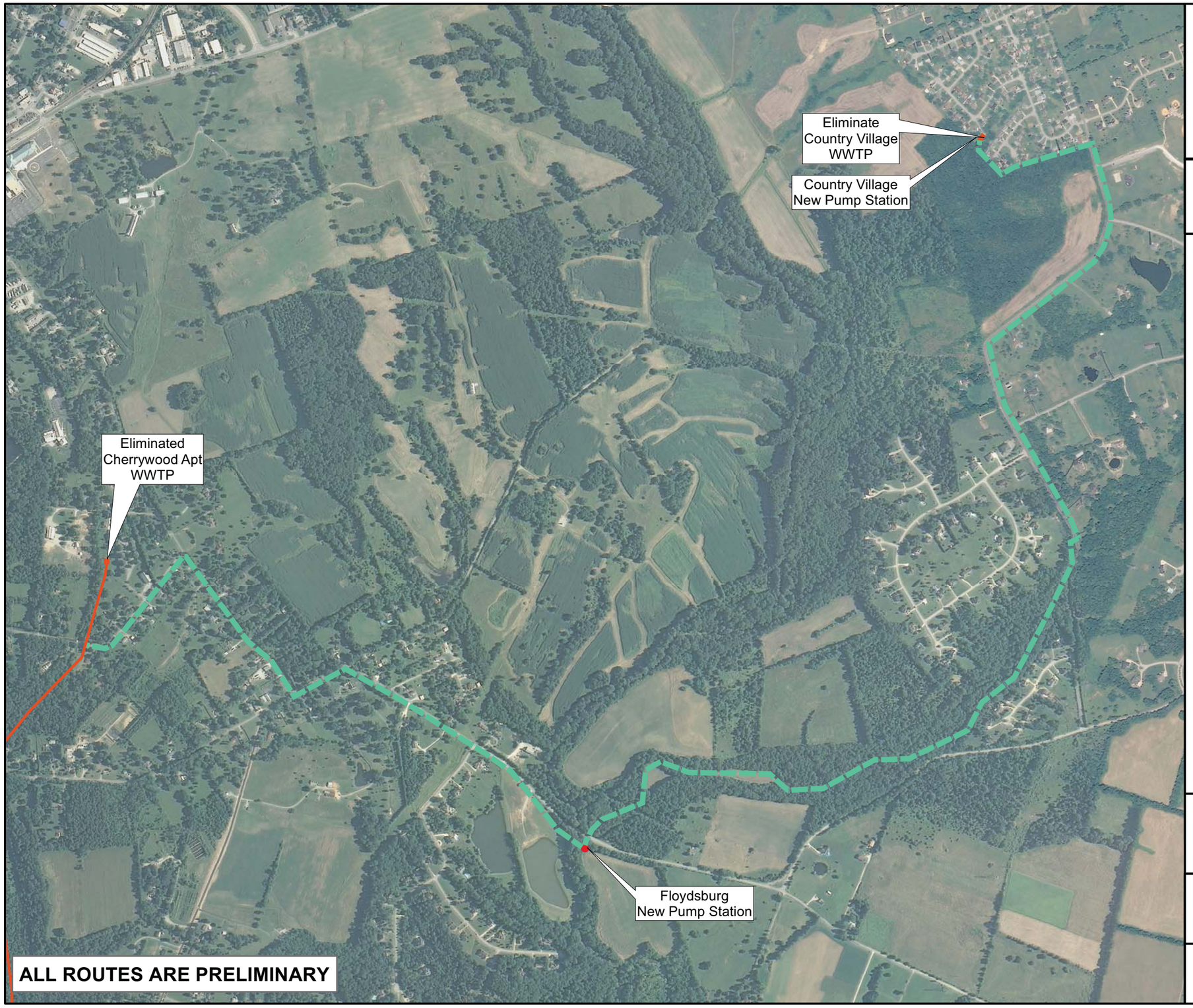

OCEA

Regional Wastewater Facility Plan

Crestwood & South Floyds Fork Planning Area

Legend

- FLOYDS FORK ALT 4 SEWER MAIN Phase 4
- EXISTING SEWER MAINS
- Floydsburg Pump Station
- WWTPs

N

0 900 1,800

Feet

Oldham County Environmental Authority

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Figure 10-4
New Regional WWTP
Phase 4 Implementation

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Phase 4 – Program Elements	Estimated Costs
Gravity Collection System Extension	$ 872,000
Floydsburg Road Pump Station / Forcemain	$ 998,000
Country Village Pump Station / Forcemain	$ 480,000
Easement Acquisition	$ 150,000
Phase 4 - Estimated Probable Program Costs	$ 2,500,000

Table 10-4: Phase 4 Probable Program Costs

Environmental Impacts

Construction of the New Regional WWTP Alternative will require complete environmental reviews and permitting by the appropriate regulatory agencies. OCEA will work with the regulatory agencies and Oldham County Planning and Development Services to select a new treatment plant site that is in an appropriately zoned area which limits environmental impacts. Likewise, the preliminary forcemain alignment will be modified as necessary, to minimize environmental impacts. During construction of the projects, mitigation measures necessary to comply with environmental regulations and construction site stormwater mitigation measures will be followed.

Removing effluent outfalls from Floyds Fork Watershed and from the head of Sleepy Hollow Lake will eliminate effluent loading of suspended solids and nutrients from these watersheds. The effluent standards required by the Waste Load Allocation for the new regional treatment plant is more stringent than any of the existing treatment plants effluent requirements and there will be a significant reduction in CBOD, suspended solids, ammonia nitrogen, phosphorous and toxicity loadings to the environment. Construction of the regional forcemain will allow the elimination of small temporary/package treatment plants and existing septic tank systems that are more vulnerable to overflows, upsets and system failures.

Construction of the New Regional WWTP Alternative will result in more reliable operations and reduce the energy use profile and costs associated with operation of the existing smaller treatment plants. Construction and operations of the New Regional WWTP Alternatives will reduce the overall environmental impacts and improve the collection and treatment of wastewater in the Crestwood and South Floyds Fork Planning Areas.

Institutional Structure

OCEA has the authority to implement the recommendations of the RFP within their planning areas. Providing service to the Institute of Women's Facility will require negotiations with the Department of Correction and OCEA will have to obtain permission from Shelby County Fiscal Court. OCEA has had preliminary discussions with Shelby County and will submit a written request to the County Judge Executive. OCEA has received a Waste Load Allocation from DOW and upon approval of the recommended plan will begin the site selection process for the new plant.

Funding Plan

In order to regionalize the Crestwood and South Floyds Fork service areas, a new Regional Treatment Facility and the necessary conveyance facilities (i.e. forcemains and pump stations), as outlined in Section 8, will require significant capital along with funding/financing to be successfully implemented. A multi-phased approach is recommended over the next several years totaling approximately $19.32 million segmented in the following four phases:

Phase 1 - $11.64 million
Phase 2 - $4.68 million
Phase 3 - $0.5 million
Phase 4 - $2.5 million

The OCEA does not usually qualify for grant funding therefore the monies will be borrowed through the issuance of Revenue Bonds and/or obtaining a Government Loan through the Kentucky Infrastructure Authority (KIA) Clean Water SRF Program. The OCEA has been successful in working with KIA in SRF low-interest loans and will continue to pursue this most favorable funding/financing option. The OCEA is currently approved for up to $6.5 million of KIA SRF funding with an interest rate of approximately 2% which can be utilized for the regional improvements. It is assumed that the remaining capital funds will also be derived from the KIA SRF program but a more conservative interest rate of 3.5% over a 20-year payback period will be utilized.

User Charge Rates

This past year, OCEA implemented a significant rate increase totaling approximately 17% which went into effect this past July 2012 and implemented the Compliance Capital Expansion Surcharge (CAPEX) to initiate appropriate rates for constructing Capital Improvement Projects. The current OCEA sewer rates are shown below:

- Monthly meter charge $15.15
- Compliance CAPEX surcharge $ 5.39
- Rate per 1,000 gallons $ 6.14

The cost for 4,000 gallons per month for a sewer customer is $45.10.

To ease the impact on its customers, the OCEA intends to implement the required rates increase over a 5-year period. All rate increases will require approval by the OCEA Board and Oldham County Fiscal Court prior to implementation.

The revenue projections must generate sufficient funds to cover utility expenses, and the capital costs for all four phases of the Regional Program. The operating revenue will also have to meet required Debt Service Coverage Ratio if utility bonds, revenue bonds or state revolving funding are used to finance the capital program. The Kentucky Infrastructure Authority (KIA) requires Debt Service Coverage 1.05 for state revolving fund loans. The estimated revenue increases needed to implement the Regional Program was based on project operating costs and debt services based on KIA coverage ratio of 1.05.

The projected revenue and sewer rate increases are as follows:

Fiscal Year	*Revenue Increase*	*Increase Per Customer**
2013/14	7.5%	$3.38/mo.
2014/15	7.5%	$3.64/mo.
2015/16	7.5%	$3.91/mo.
2016/17	11.5%	$4.20/mo.
2017/18	7.5%	$4.52/mo.

**** Based upon 4,000 gallons per month usage and capacity contribution from Institute for Women***

Implementation Schedule

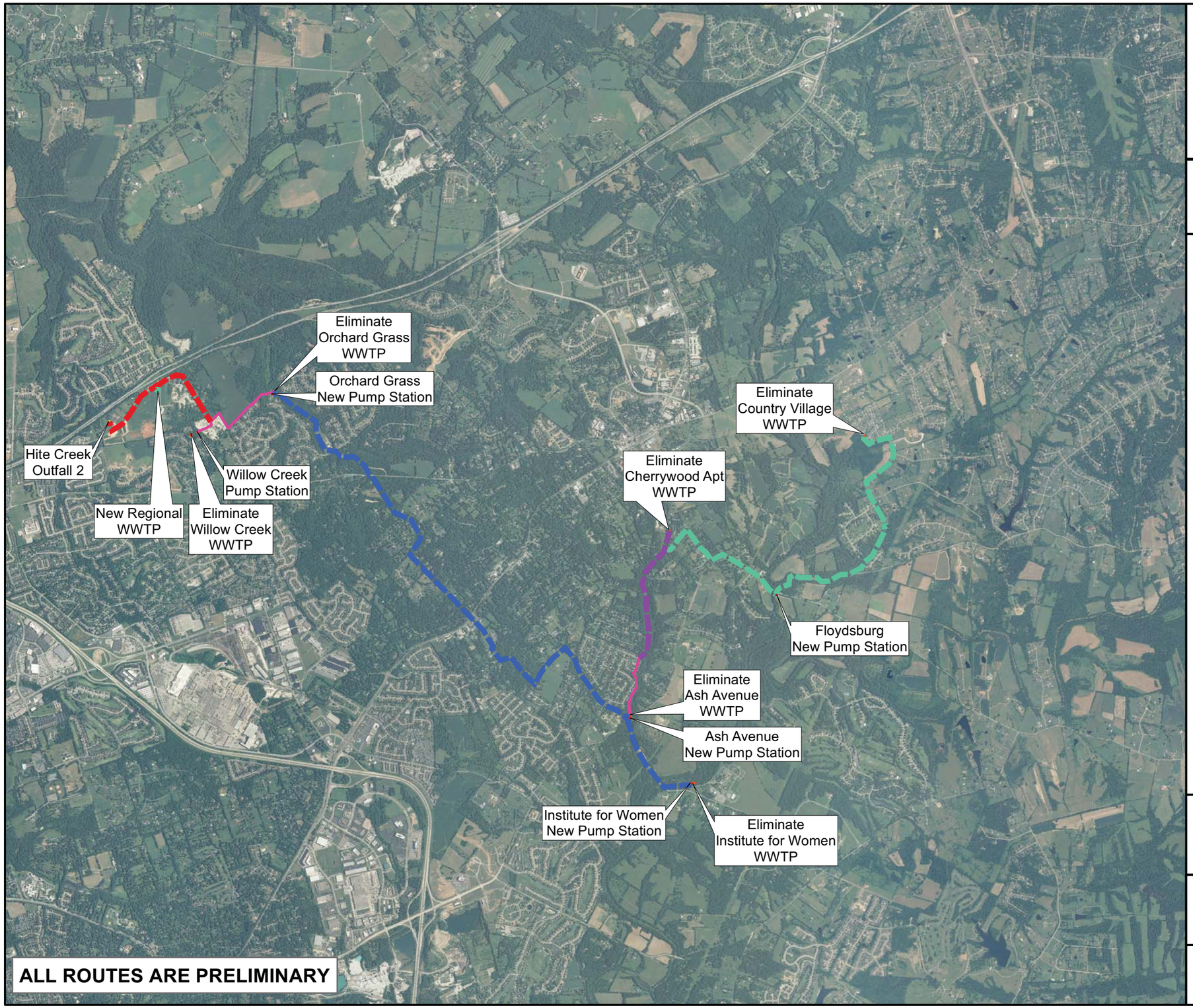
A Regional Facility Plan Implementation Schedule has been developed involving a phased approach to allow OCEA appropriate time and sequencing to effectively manage the recommended plan (See Figure 10-5). Key elements of the Implementation Plan involve the following:

- Property/easement acquisition
- Interlocal Agreement w/DOC Institute for Women
- Funding/Financing (KIA SRF Low-Interest Loans)

OCEA

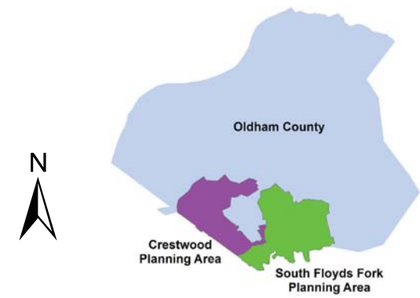
Regional Wastewater Facility Plan

Crestwood & South Floyds Fork Planning Areas



Legend

- New Sewer Main Phase 1
- New Sewer Main Phase 2
- New Sewer Main Phase 3
- New Sewer Main Phase 4
- Hite Creek Outfall Sewer Main
- Existing Sewer Mains
- Crestwood New Regional WWTP
- Hite Creek New Outfall 2
- Orchard Grass Pump Station
- Ash Ave Pump Station
- Institute for Women Pump Station
- Floydsburg Pump Station
- WWTPs



0 900 1,800 3,600 5,400 7,200 9,000 Feet

Oldham County Environmental Authority

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Figure 10-5
Integrated Alternative 4: New Regional WWTP Implementation Phases

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Table 10-5

Implementation Schedule for Recommended Alternative

Project	Subtask	2013				2014				2015				2016				2017			
		1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
Phase 1 - Willow Creek/Orchard Grass																					
	Property/Easement Acquisition																				
	Interlocal Agreement - DOC/Institute for Women																				
	Design and Permitting																				
	Funding/Financing Approval																				
	Bidding/Construction																				
Phase 2 - Ash Avenue/Institute for Women																					
	Property/Easement Acquisition																				
	Design and Permitting																				
	Funding/Financing Approval																				
	Bidding/Construction																				
Phase 3 - Cherrywood Apartments																					
	Property/Easement Acquisition																				
	Design and Permitting																				
	Funding/Financing Approval																				
	Bidding/Construction																				
Phase 4 - Country Village																					
	Property/Easement Acquisition																				
	Design and Permitting									To Be Determined											
	Funding/Financing Approval																				
	Bidding/Construction																				

Section 11 – Documentation of Public Participation

Public Hearing

The DOW approval process for Regional Facilities Plans required OCEA to conduct a Public Hearing and present the recommended plan to the public. OCEA will advertise the RFP and request public comment on the plan and will accept public comment for a minimum of 30 days. OCEA will address these comments and submit a final plan to DOW for approval.

OCEA conducted an initial Public Hearing on August 27, 2012 and presented the alternatives that would be evaluated in the RFP. OCEA also held a Facility Plan Workshop, as part of its regular Board meeting on September 20, 2012. These public hearings/workshop do not meet the Public Hearing requirement required by DOW regulations. OCEA's plan to meet DOW's regulations for public participation is to advertise the plan for public comment after the Facility Plan is published on the DOW Website.

An advertisement for the public hearing will be published in the Oldham Era and posted to the DOW Public Notice Web site.

After completing the Final Public Hearing the public participation will be documented and the following documents will be included in the RFP appendix:

1. Certificated Copy of the newspaper advertisement
2. Public Hearing Attendance Sheet
3. Copy of OCEA's Public Hearing Presentation
4. Record transcript of the Hearing
5. Copy of public comments and responses.

Section 12 – Completeness Checklist and Forms

Completeness Checklist and Forms

Section 12: Regional Facility Plan Completeness Checklist and Forms

Requirements: Two (2) hard copies, one certified by a professional engineer licensed in Kentucky and one (1) non-certified digital copy of the regional facility plan and the planning area shapefile on a Compact Disc (CD) shall be submitted to the Cabinet. This completeness checklist should be completed and submitted with each regional facility plan.

Regional Planning Agency Name: Oldham County Environmental Authority

Date: July 9, 2013

		PAGE #
SECTION 1		
REGIONAL FACILITY PLAN SUMMARY- This section shall provide a brief summary of the information provided in the facility plan, including the following:		1-1 - 1-4
1.	Purpose of the plan and major problems evaluated in the plan.	1-2 - 1-3
2.	Recommended alternative chosen to remediate or correct the problems and/or serve the area of need identified in the plan. Also, include any institutional arrangements necessary to implement the recommended alternative(s).	1-3
3.	Estimated cost of implementing the proposed plan (including user fees) and the proposed funding method to be used.	1-4
4.	Planning agency commitments necessary to implement the plan.	1-4
5.	Schedule of implementation for projects.	1-4
SECTION 2		
STATEMENT OF PURPOSE AND NEED- This section shall contain a brief description of the purpose and need for a submitting the facility plan.		2-1 - 2-2
SECTION 3		
PHYSICAL CHARACTERISTICS OF THE PLANNING AREA- This section shall delineate the planning area boundaries and describe key topographic, geographic and pertinent natural or man-made features of the area. Digital or electronic submission of the planning area boundary shapefile in a standard GIS format shall also be included. This section shall also include the following maps:		3-1 - 3-2
1.	One (1) up-to-date map, suitable for photocopying, indicate the planning area boundary, service area boundary, watershed boundaries, county lines, populated places, cities and/or towns and project areas or proposed planning period phases.	Figure 3-1
2.	One (1) up-to-date map, suitable for photocopying, include locations of wastewater treatment facilities (including package treatment plants), discharge location(s), collection lines (gravity, force main, interceptors), pump stations, public drinking water intake points and groundwater supply areas [Source Water Area Protection Plans (SWAPP) and/or Wellhead Protection Areas (WHPA)].	Figure 6-1
3.	One (1) seven and one-half (7 ½) minute USGS topographic map including the location of wetlands, delineation of the 100-year floodplain, surface water(s), and topography.	Figure 5-1

4.	If available, a local planning and zoning land use map.	Figure3-2
	SECTION 4	
SOCIOECONOMIC CHARACTERISTICS OF THE PLANNING AREA- The following characteristics of the planning area shall be discussed:		4-1 - 4-4
1.	Historical, current, and projected population in the planning area including wastewater contributions from industrial and commercial sources.	4-1 - 4-3
2.	Current and projected population in the existing service area and unsewered parts of the planning area	Tables 4-1, 4-2 4-3, 4-4
3.	Economic or social benefit to the affected community	4-4
	SECTION 5	
EXISTING ENVIRONMENT IN THE PLANNING AREA- Describe existing physical, biological, cultural, and other resource features within the planning area with an emphasis on those that may be impacted by the proposed plan or projects, including the following:		5-1 - 5-8
1.	Physical features such as surface and groundwater quality, water sources and supply, wetlands, lakes, streams, air pollution, floodplains, soils, geology, and topography	5-1 - 5-4
2.	Biological: Identify plant and animal communities in the planning area with an emphasis upon endangered and threatened species likely to be impacted	5-5
3.	Cultural: Describe archaeological and historical resources that may be affected by the proposed project	5-8
4.	Other Resource Features such as national and state parks, recreational areas, USDA Designated Important Farmland, and any other applicable environmentally sensitive areas	5-1 - 5-8
	SECTION 6	
EXISTING WASTEWATER SYSTEM- This section shall be prepared by a Professional Engineer licensed in Kentucky. A description of the existing facilities within the planning area shall include the following:		6-1 - 6-5
1.	On-site systems in the planning area	6-1
2.	Physical condition of the existing wastewater treatment plant(s) including the type, age, design capacity, process units, peak and average wastewater flows, current discharge permit limits, schematic layout of treatment plant. Include a narrative description of the capacity of the treatment plant to meet reliability and redundancy requirements as outlined in regulation 401 KAR 5:005, Section 13.	6-1 - 6-2
3.	Existing collection and conveyance system and its condition	6-2
4.	Existing biosolids disposal method	6-2
5.	Existing operation, maintenance and compliance issues	6-4
	SECTION 7	
FORECASTS OF FLOWS AND WASTE LOADS IN THE PLANNING AREA- This section shall be prepared by a professional engineer licensed in Kentucky and shall include:		7-1 - 7-6
1.	Current and projected commercial, industrial and residential growth for the proposed planning period	Table 7-2
2.	A copy of the waste load allocation (WLA) issued by the DOW for new or expanded treatment plant projects	Table 7-6

SECTION 8		
EVALUATION OF ALTERNATIVES- This section shall be prepared by a professional engineer licensed in Kentucky and include an assessment of alternatives to determine the appropriate facilities that will meet the wastewater needs of the planning area and provide benefits that are cost-effective and environmentally sound. The section shall include:		8-1 - 8-27
1.	No-action alternative	8-3 - 8-6
2.	Optimization of existing facilities	8-1 - 8-9
3.	Regionalization	8-1 - 8-27
4.	Other alternatives	8-1 - 8-27
5.	Detailed cost analysis along with 20 year present worth analysis for each alternative	8-9 - 8-24
6.	Recommended alternative	8-26 - 8-27
SECTION 9		
CROSS-CUTTER CORRESPONDENCE AND MITIGATION- Each facility plan shall include cross-cutter correspondences to and from each agency related to the following four environmental and cultural concerns:		9-1
1.	Threatened and Endangered Species: The U.S. Fish and Wildlife Service- Kentucky Ecological Services Field Station and the Kentucky Department of Fish and Wildlife Resources	9-1
2.	Historical Resources: The Kentucky Heritage Council State Historic Preservation Office	9-1
3.	Aquatic Resources: The US. Army Corps of Engineers (Louisville, Nashville, or Huntington Districts).	9-1
4.	Agricultural Resources: The local office of the Natural Resources Conservation Service (NRCS) or USDA Service Center	9-1
SECTION 10		
EVAULATION OF RECOMMENDED REGIONAL FACILITY PLAN- This section of the facility plan shall summarize the critical components of the recommended plan.		10-1 - 10-6
1.	Environmental impacts	10-4
2.	Institutional structure	10-4
3.	Funding plan	10-5
4.	Current and projected residential user charge rate based on 4,000 gallon usage per month	10-5 - 10-6
5.	Implementation schedule	10-6
SECTION 11		
DOCUMENTATION OF PUBLIC PARTICIPATION- The section shall include a copy of the newspaper advertisement/proof of publication, attendance sheet, and public comments.		11-1

Unit Process Design Criteria Form

Unit Process	Number of Units[1]	Flow per Unit (MGD)	Design Criteria[2]
Influent Pumping	3-1	1.7	10 States Standards, Hydraulic Institute, Variable Speed
Screening	1	3.2	W/Emergency By-pass 10 States Standards
Grit Removal	N/A		Future unit process
Primary Clarification	N/A		
Biological Process	2	0.94 mgd	10 States Standards, WEF, MOP 8
Chemical Phosphorus Removal	2	3.25	10 States Standards, WEF, MOP 8
Final Clarification	2	0.94	10 States Standards,EPA Reliability 1.5 Standards
Disinfection	2	1.25	10 States Standards, EPA MOP 8
RAS/WAS Pumping	3	0.94	10 States Standards, MOP 8
Sludge Treatment	1	20-30 days storage	10 States Standards, WEF MOP 8
Sludge Dewatering	N/A		Sludge Dewatering at KSR WWTP

1*The number of units shall be in accordance with the reliability/redundancy checklist
2*The design criteria shall be in accordance with 401 KAR 5:005 including Ten States Standards

Note: This is a suggested format only. The process listed here will not fit every project and will therefore need to be revised accordingly.

Note: Design Standards for the Project

1) 10 States Standards for Wastewater Facilities
2) Water Environmetn Federation, Manual of Practice 8, Design of Municipal Wastewater Treatment Plants, MOP FD-13, Aeration
3) Division of Water Regulations Reliability Class C
4) EPA Reliability Standards for Wastewater Treatment

APPENDIX

APPENDIX 1-1

Opinion of Probable Construction Costs

OPINION OF PROBABLE COSTS

FOR

PRELIMINARY ESTIMATE
WASTEWATER IMPROVEMENTS
OLDHAM COUNTY ENVIRONMENTAL AUTHORITY FACILITY PLAN

NOTE: FOOTAGES WERE SPLIT AS INDICATED BY COLORS BELOW, FOR ASSUMED DEPTHS;

Forcemain			
Floydsburg PS (West of Currys Fork to Cherry Wood Apt) -Total	**10"**	**6250**	**L.F.**
Country Village PS	**6"**	**1300**	**L.F.**
Ash Ave	**12"**	**4165**	**L.F.**
Ash to 146	**12"**	**6075**	**L.F.**
146 to 22	**12"**	**8075**	**L.F.**
22 to Orchard Grass WWTP	**12"**	**5850**	**L.F.**
Haunz Lane	**12"**	**3450**	**L.F.**
Outfall 2	**10"**	**3090**	**L.F.**
Institute to Ash	**6"**	**4430**	**L.F.**
Gravity			
Abbott Lane (Country Village to Ashers Run Creek) - Total	**12"**	**4400**	**L.F.**
Cherry Wood Apartments	**12"**	**800**	**L.F.**
Ashers Run Creek (West of Abbott Ln) -Total	**15"**	**6510**	**L.F.**
Cherry Ln South (Along Floyds Fork Tributary 1)	**15"**	**5060**	**L.F.**

Phase 1 - OCEA New Regional Pump Station

ITEM	DESCRIPTION		APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
SANITARY SEWER MAIN						
1	12" PVC SDR-26, CL. 160 Sanitary Sewer,	0'-8.0' Depth	0	LF	$ 54.00	$ -
2	12" PVC SDR-26, CL. 160 Sanitary Sewer,	8.1'-10.0' Depth	0	LF	$ 54.00	$ -
3	12" PVC SDR-26, CL. 160 Sanitary Sewer,	10.1'-12.0' Depth	0	LF	$ 54.00	$ -
4	15" PVC SDR-26, CL. 160 Sanitary Sewer,	0'-8.0' Depth	0	LF	$ 58.00	$ -
5	15" PVC SDR-26, CL. 160 Sanitary Sewer,	8.1'-10.0' Depth	0	LF	$ 58.00	$ -
6	6" PVC SDR-26, CL. 160 Forcemain		0	LF	$ 45.00	$ -
7	10" PVC SDR-26, CL. 160 Forcemain, In Roadway		3,090	LF	$ 78.75	$ 243,337.50
8	12" PVC SDR-26, CL. 160 Forcemain, In Roadway		3,450	LF	$ 94.50	$ 326,025.00
9	12" PVC SDR-26, CL. 160 Forcemain		0	LF	$ 75.00	$ -
10	Pump Station Capacity - 70 GPM (0.1 MGD)		0	EA	$ 147,000.00	$ -
11	Pump Station Capacity - 350 GPM (0.5 MGD)		0	EA	$ 200,000.00	$ -
12	Pump Station Capacity - 700 GPM (1.0 MGD)		0	EA	$ 257,250.00	$ -
13	Pump Station Capacity - 1050 GPM (1.5 MGD)		1	GAL	$ 315,000.00	$ 315,000.00
14	Pump Station Capacity - 1400 GPM (2.0 MGD)		0	GAL	$ 385,000.00	$ -
15	Pump Station Capacity - 1750 GPM (2.5 MGD)			GAL	$ 450,000.00	$ -
16	Wastewater Treatment - Advanced Secondary		1,250,000	GAL	$ 6.03	$ 7,533,527.41
17	Wastewater Treatment - Advanced w/ Filters			GAL	$ 6.75	$ -
18	Wastewater Treatment - Secondary w/ Phosphorous			GAL	$ 5.50	$ -
19	Wastewater Treatment - Tertiary Treatment			GAL	$ 8.50	$ -
20	Site Development -		0	Acre	$ 15,000.00	$ -
21	WWTP Property Acquisition		10	Acre	$ 50,000.00	$ 500,000.00
22	Jack and Bore		0	LF	$ 600.00	$ -
23	Pavement Restoratation			SF	$ 3.00	$ -

TOTAL BASE BID AMOUNT $ 8,917,889.91

			Total
Easements	**6,540**	**$ 6.00**	**$ 39,240.00**
Estimated Construction Cost			**$ 8,957,129.91**
Legal, Administration & Specialty Services (5%)			**$ 447,856.50**
Contingencies and Technical Services (25%)			**$ 2,239,282.48**
Estimated Capital Costs			**$ 11,644,268.88**
Annual Payment at 3.5% on top of 6.5 M Existing			**$ 362,156.53**

OPINION OF PROBABLE COSTS

FOR

PRELIMINARY ESTIMATE
WASTEWATER IMPROVEMENTS
OLDHAM COUNTY ENVIRONMENTAL AUTHORITY FACILITY PLAN

NOTE: FOOTAGES WERE SPLIT AS INDICATED BY COLORS BELOW, FOR ASSUMED DEPTHS;

Forcemain			
Floydsburg PS (West of Currys Fork to Cherry Wood Apt) -Total	**10"**	**6250**	**L.F.**
Country Village PS	**6"**	**1300**	**L.F.**
Ash Ave	**12"**	**4165**	**L.F.**
Ash to 146	**12"**	**6075**	**L.F.**
146 to 22	**12"**	**8075**	**L.F.**
22 to Orchard Grass WWTP	**12"**	**5850**	**L.F.**
Haunz Lane	**12"**	**3450**	**L.F.**
Outfall 2	**10"**	**3090**	**L.F.**
Institute to Ash	**6"**	**4430**	**L.F.**
Gravity			
Abbott Lane (Country Village to Ashers Run Creek) - Total	**12"**	**4400**	**L.F.**
Cherry Wood Apartments	**12"**	**800**	**L.F.**
Ashers Run Creek (West of Abbott Ln) -Total	**15"**	**6510**	**L.F.**
Cherry Ln South (Along Floyds Fork Tributary 1)	**15"**	**5060**	**L.F.**

Phase 2 - OCEA New Regional WWTP

ITEM	DESCRIPTION	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
SANITARY SEWER MAIN					
1	12" PVC SDR-26, CL. 160 Sanitary Sewer, 0'-8.0' Depth		LF	$ 54.00	$ -
2	12" PVC SDR-26, CL. 160 Sanitary Sewer, 8.1'-10.0' Depth		LF	$ 54.00	$ -
3	12" PVC SDR-26, CL. 160 Sanitary Sewer, 10.1'-12.0' Depth		LF	$ 54.00	$ -
4	15" PVC SDR-26, CL. 160 Sanitary Sewer, 0'-8.0' Depth		LF	$ 58.00	$ -
5	15" PVC SDR-26, CL. 160 Sanitary Sewer, 8.1'-10.0' Depth		LF	$ 58.00	$ -
6	6" PVC SDR-26, CL. 160 Forcemain	4,030	LF	$ 47.25	$ 190,418
7	10" PVC SDR-26, CL. 160 Forcemain, In Roadway		LF	$ 75.00	$ -
8	12" PVC SDR-26, CL. 160 Forcemain, In Roadway	4,165	LF	$ 94.50	$ 393,593
9	12" PVC SDR-26, CL. 160 Forcemain	19,630	LF	$ 78.75	$ 1,545,863
10	Pump Station Capacity - 70-180 GPM (0.1 to 0.25 MGD)	2	EA	$ 147,000.00	$ 294,000
11	Pump Station Capacity - 350 GPM (0.5 MGD)	1	EA	$ 200,000.00	$ 200,000
12	Pump Station Capacity - 700 GPM (1.0 MGD)		EA	$ 257,250.00	$ -
13	Pump Station Capacity - 1050 GPM (1.5 MGD)	1	GAL	$ 315,000.00	$ 315,000
14	Pump Station Capacity - 1400 GPM (2.0 MGD)		GAL	$ 385,000.00	$ -
15	Pump Station Capacity - 1750 GPM (2.5 MGD)		GAL	$ 450,000.00	$ -
16	Wastewater Treatment - Advanced Secondary		GAL	$ 6.50	$ -
17	Wastewater Treatment - Advanced w/ Filters		GAL	$ 6.75	$ -
18	Wastewater Treatment - Secondary w/ Phosphorous		GAL	$ 5.50	$ -
19	Wastewater Treatment - Tertiary Treatment		GAL	$ 8.50	$ -
20	Site Development -		Acre	$ 65,000.00	$ -
21	WWTP Property Acquisition		Acre	$ 50,000.00	$ -
22	Jack and Bore	770	LF	$ 630.00	$ 485,100
23	Pavement Restoratation		SF	$ 3.00	$ -

TOTAL BASE BID AMOUNT $ 3,423,973

Easements	**28,595**	**$ 6.00**	**$**	**171,570**
Estimated Construction Cost			**$**	**3,595,543**
Legal, Administration & Specialty Services (5%)			**$**	**179,777**
Contingencies and Technical Services (25%)			**$**	**898,886**
Estimated Capital Costs			**$**	**4,674,205**
Annual Payment at 3.5%			**$**	**329,064**

OPINION OF PROBABLE COSTS

FOR

PRELIMINARY ESTIMATE
WASTEWATER IMPROVEMENTS
OLDHAM COUNTY ENVIRONMENTAL AUTHORITY FACILITY PLAN

NOTE: FOOTAGES WERE SPLIT AS INDICATED BY COLORS BELOW, FOR ASSUMED DEPTHS;

Forcemain			
Floydsburg PS (West of Currys Fork to Cherry Wood Apt) -Total	**10"**	**6250**	**L.F.**
Country Village PS	**6"**	**1300**	**L.F.**
Ash Ave	**12"**	**4165**	**L.F.**
Ash to 146	**12"**	**6075**	**L.F.**
146 to 22	**12"**	**8075**	**L.F.**
22 to Orchard Grass WWTP	**12"**	**5850**	**L.F.**
Haunz Lane	**12"**	**3450**	**L.F.**
Outfall 2	**10"**	**3090**	**L.F.**
Institute to Ash	**6"**	**4430**	**L.F.**
Gravity			
Abbott Lane (Country Village to Ashers Run Creek) - Total	**12"**	**4400**	**L.F.**
Cherry Wood Apartments	**12"**	**800**	**L.F.**
Ashers Run Creek (West of Abbott Ln) -Total	**15"**	**6510**	**L.F.**
Cherry Ln South (Along Floyds Fork Tributary 1)	**15"**	**5060**	**L.F.**

Phase 3- New Regional WWTP

ITEM	DESCRIPTION		APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
SANITARY SEWER MAIN						
1	12" PVC SDR-26, CL. 160 Sanitary Sewer,	0'-8.0' Depth	800	LF	$ 54.00	$ 43,200
2	12" PVC SDR-26, CL. 160 Sanitary Sewer,	8.1'-10.0' Depth		LF	$ 54.00	$ -
3	12" PVC SDR-26, CL. 160 Sanitary Sewer,	10.1'-12.0' Depth		LF	$ 54.00	$ -
4	15" PVC SDR-26, CL. 160 Sanitary Sewer,	0'-8.0' Depth		LF	$ 58.00	$ -
5	15" PVC SDR-26, CL. 160 Sanitary Sewer,	8.1'-10.0' Depth	5,060	LF	$ 60.90	$ 308,154
6	6" PVC SDR-26, CL. 160 Forcemain			LF	$ 45.00	$ -
7	10" PVC SDR-26, CL. 160 Forcemain, In Roadway			LF	$ 75.00	$ -
8	12" PVC SDR-26, CL. 160 Forcemain, In Roadway			LF	$ 90.00	$ -
9	12" PVC SDR-26, CL. 160 Forcemain			LF	$ 75.00	$ -
10	Pump Station Capacity - 70 GPM (0.1 MGD)			EA	$ 147,000.00	$ -
11	Pump Station Capacity - 350 GPM (0.5 MGD)			EA	$ 200,000.00	$ -
12	Pump Station Capacity - 700 GPM (1.0 MGD)			EA	$ 257,250.00	$ -
13	Pump Station Capacity - 1050 GPM (1.5 MGD)			GAL	$ 315,000.00	$ -
14	Pump Station Capacity - 1400 GPM (2.0 MGD)			GAL	$ 385,000.00	$ -
15	Pump Station Capacity - 1750 GPM (2.5 MGD)			GAL	$ 450,000.00	$ -
16	Wastewater Treatment - Advanced Secondary			GAL	$ 6.50	$ -
17	Wastewater Treatment - Advanced w/ Filters			GAL	$ 6.75	$ -
18	Wastewater Treatment - Secondary w/ Phosphorous			GAL	$ 5.50	$ -
19	Wastewater Treatment - Tertiary Treatment			GAL	$ 8.50	$ -
20	Site Development -			Acre	$ 65,000.00	$ -
21	WWTP Property Acquisition			Acre	$ 50,000.00	$ -
22	Jack and Bore			LF	$ 600.00	$ -
23	Pavement Restoratation			SF	$ 3.00	$ -

TOTAL BASE BID AMOUNT $ 351,354

P:\12e2435\Design\Quantities Calculations\Capital Costs\SFF ALT 4\[Copy of Opinion Probable Cost.June.Resubmittal.alt4.xlsx]opinion Initial Phase

Easements	**5,860**	**$ 6.00**	**$**	**35,160**
Estimated Construction Cost			**$**	**386,514**
Legal, Administration & Specialty Services (5%)			**$**	**19,326**
Contingencies and Technical Services (25%)			**$**	**96,629**
Estimated Capital Costs			**$**	**502,468**
Annual Payment at 3.5%			**$**	**35,374**

OPINION OF PROBABLE COSTS

FOR

PRELIMINARY ESTIMATES
WASTEWATER IMPROVEMENTS
OLDHAM COUNTY ENVIRONMENTAL AUTHORITY FACILITY PLAN

NOTE: FOOTAGES WERE SPLIT AS INDICATED BY COLORS BELOW, FOR ASSUMED DEPTHS;

Forcemain			
Floydsburg PS (West of Currys Fork to Cherry Wood Apt) -Total	**10"**	**6250**	**L.F.**
Country Village PS	**6"**	**1300**	**L.F.**
Ash Ave	**12"**	**4165**	**L.F.**
Ash to 146	**12"**	**6075**	**L.F.**
146 to 22	**12"**	**8075**	**L.F.**
22 to Orchard Grass WWTP	**12"**	**5850**	**L.F.**
Haunz Lane	**12"**	**3450**	**L.F.**
Outfall 2	**10"**	**3090**	**L.F.**
Institute to Ash	**6"**	**4430**	**L.F.**
Gravity			
Abbott Lane (Country Village to Ashers Run Creek) - Total	**12"**	**4400**	**L.F.**
Cherry Wood Apartments	**12"**	**800**	**L.F.**
Ashers Run Creek (West of Abbott Ln) -Total	**15"**	**6510**	**L.F.**
Cherry Ln South (Along Floyds Fork Tributary 1)	**15"**	**5060**	**L.F.**

Phase 4 -OCEA New Regional WWTP

ITEM	DESCRIPTION		APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
SANITARY SEWER MAIN						
1	12" PVC SDR-26, CL. 160 Sanitary Sewer,	0'-8.0' Depth		LF	$ 56.70	$ -
2	12" PVC SDR-26, CL. 160 Sanitary Sewer,	8.1'-10.0' Depth		LF	$ 125.00	$ -
3	12" PVC SDR-26, CL. 160 Sanitary Sewer,	10.1'-12.0' Depth	4,400	LF	$ 56.70	$ 249,480.00
4	15" PVC SDR-26, CL. 160 Sanitary Sewer,	0'-8.0' Depth	6,510	LF	$ 60.90	$ 396,459.00
5	15" PVC SDR-26, CL. 160 Sanitary Sewer,	8.1'-10.0' Depth		LF	$ 65.00	$ -
6	6" PVC SDR-26, CL. 160 Forcemain		1,300	LF	$ 75.00	$ 97,500.00
7	10" PVC SDR-26, CL. 160 Forcemain, In Roadway		5,950	LF	$ 78.75	$ 468,562.50
8	12" PVC SDR-26, CL. 160 Forcemain, In Roadway			LF	$ 94.50	$ -
9	12" PVC SDR-26, CL. 160 Forcemain			LF	$ 78.75	$ -
10	Pump Station Capacity - 70 GPM (0.1 MGD)		1	EA	$ 147,000.00	$ 147,000.00
11	Pump Station Capacity - 350 GPM (0.5 MGD)			EA	$ 200,000.00	$ -
12	Pump Station Capacity - 700 GPM (1.0 MGD)		1	EA	$ 257,250.00	$ 257,250.00
13	Pump Station Capacity - 1050 GPM (1.5 MGD)			GAL	$ 315,000.00	$ -
14	Pump Station Capacity - 1400 GPM (2.0 MGD)			GAL	$ 385,000.00	$ -
15	Pump Station Capacity - 1750 GPM (2.5 MGD)			GAL	$ 450,000.00	$ -
16	Wastewater Treatment - Advanced Secondary			GAL	$	$ -
17	Wastewater Treatment - Advanced w/ Filters			GAL	$	$ -
18	Wastewater Treatment - Secondary w/ Phosphorous			GAL	$	$ -
19	Wastewater Treatment - Tertiary Treatment			GAL	$	$ -
20	Site Development -			Acre	$ 65,000.00	$ -
21	WWTP Property Acquisition			Acre	$ 50,000.00	$ -
22	Jack and Bore		300	LF	$ 630.00	$ 189,000.00
23	Pavement Restoratation			SF	$ 3.00	$ -

TOTAL BASE BID AMOUNT $ 1,805,251.50

Easements	**18,460**	**$ 6.00**	**$ 110,760.00**
Estimated Construction Cost			**$ 1,916,011.50**
Legal, Administration & Specialty Services (5%)			**$ 95,800.58**
Contingencies and Technical Services (25%)			**$ 479,002.88**
Estimated Capital Costs			**$ 2,490,814.95**
Annual Payment at 3.5%			**$ 175,353.37**

APPENDIX 1-2

Kentucky Division of Water (KDOW)

Wasteload Allocation Determination

STEVEN L. BESHEAR
GOVERNOR

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WATER
200 FAIR OAKS LANE
FRANKFORT, KENTUCKY 40601
www.kentucky.gov

LEONARD K. PETERS
SECRETARY

October 28, 2011

Ed Basquill, P.E.
Project Manager
Oldham County Environmental Authority (OCEA)
700 West Jefferson Street
LaGrange, Kentucky 40031

Re: Waste Load Allocation Request
Follow-up from Agreed Order Conference
Oldham County, Kentucky

Dear Mr. Basquill:

This is in response to your March 7, 2011 letter (attached), requesting a waste load allocation (WLA) for a proposed wastewater treatment plant (WWTP) to be located in the vicinity of Orchard Grass WWTP:

- Site 1: Orchard Grass WWTP Location (KPDES No.: KY0033821)
- Site 2: Glen Oaks Lake (38°19'48.98"N / 85°32'21.73"W)

The design capacity to be considered is 1.6 MGD. The division understands that the requested WLA information will be utilized in drafting a Regional Wastewater Facilities Plan update.

The division notes that the proposed WWTP sites are located within the impaired Harrods Creek watershed. The applicable Harrods Creek Total Maximum Daily Load (TMDL), which was approved April 10, 1995, addresses organic enrichment/low dissolved oxygen impairments in the backwater area of Harrods Creek (approximately mile point (mp) 0.0 to 4.2). The TMDL/water quality strategy calls for elimination of the eight (8) WWTPs discharging to lower Harrods Creek and the eleven (11) WWTPs upstream of Sleepy Hollow Lake. To date, only one (1) WWTP in lower Harrods Creek and nine (9) WWTPs upstream of Sleepy Hollow Lake have been eliminated. Consequently, a WLA cannot be provided for discharge from either of the proposed WWTP sites since any discharge would be upstream of Sleepy Hollow Lake, contrary to the water quality strategy described in the approved TMDL.

Regardless, OCEA has more recently indicated an interest to have the division provide a WLA for a discharge directly to Hite Creek. Considering the applicable TMDL requirements, a WLA for discharge to Hite Creek in the vicinity of mp 2.2 is approvable for the proposed WWTP[1]. Effluent from Hite Creek travels over five (5) miles before reaching the impaired backwater area of Harrods Creek. This flow is believed to be beneficial since it provides a steady inflow of high quality water.

[1] Should this discharge site prove not to be feasible due to easements and/or other considerations, an alternate location on Hite Creek may be selected; however, the site shall be subject to approval by the division.

Considering the above-mentioned information, the wastewater treatment facility must be designed to produce the following effluent concentrations.

Design Capacity = 1.6 MGD / Discharge to Hite Creek (near mp 2.2 or alternate Hite Creek site approved by the division)

Parameter	May 1 - October 31	November 1 - April 30
$CBOD_5$	10 mg/l	10 mg/l
Total Suspended Solids	30 mg/l	30 mg/l
Ammonia Nitrogen	2 mg/l	5 mg/l
Dissolved Oxygen	7 mg/l	7 mg/l
Total Phosphorus	1 mg/l	2 mg/l
Total Nitrogen	Monitor, mg/l	Monitor, mg/l
Total Residual Chlorine	0.011 mg/l	0.011 mg/l
Toxicity	1.0 TUc	1.0 TUc

Reliability Classification = Grade C

In addition to the above requirements, the monthly average and weekly maximum values of E. coli shall be at or below 130 colonies per 100 milliliters or 240 colonies per 100 milliliters, respectively, the year around. If a form of chlorine is proposed to disinfect the wastewater, then de-chlorination will likely be needed to achieve the chlorine residual effluent concentration. Additional effluent limitations and water quality standards are contained in 401 KAR Chapter 5 and 401 KAR Chapter 10.

These preliminary design effluent limitations are valid for one (1) year from the date of this letter, and are subject to change as a result of additional information which may be presented during the public notice phase of the KPDES permitting process. As such, this letter does not convey any authorization or approval to proceed with the construction or operation of the proposed WWTP. Construction and KPDES permit applications must be submitted to request such authorization or approval. Nor does this letter ensure issuance of either permit. During the review processes of these permits the division will further evaluate the viability of the project.

Should you have any questions regarding this letter, please contact Courtney Seitz, of my staff, at (502) 564-8158, extension 4914 or E-mail at Courtney.Seitz@ky.gov.

Sincerely,

Jory M. Becker, P.E.
Environmental Engineer Branch Manager
Surface Water Permits Branch
Division of Water

JMB:CS
c: Anshu Singh, Water Infrastructure Branch
Compliance and Technical Assistance Branch, Louisville Section
Division of Water Files

Draft May 1, 2012 - Original on File @ OCEA

Oldham County Environmental Authority

April 19, 2012

Mr. Jory Becker
Division of Water
200 Fair Oaks Lane
Fourth Floor
Frankfort, KY 40601

Re: Waste Load Allocation Request (Ash Ave)

Mr. Becker:

As you know, Oldham County Environmental Authority (OCEA) has been in discussions with MSD Louisville for a regional agreement where MSD would treat the flow for Ash Ave, Orchard, and Willow WWTP's allowing us to decommission those facilities. The 2000 Facility Plan submitted jointly by Oldham County Sewer District and MSD, recommended the Ash Avenue WWTP flow be treated by the Floyds Fork WWTP and on December 1, 2008 you provided MSD Louisville a preliminary Waste Load Allocation (WLA) for expanding the Floyds Fork WWTP to a design flow of 6.5 mgd in accordance with the 2000 Facility Plan. A copy of MSD's Preliminary WLA is provided for your reference.

We currently have a permit to treat and discharge effluent from the Ash Ave WWTP to an unnamed tributary to Floyds Fork Creek and a waste load allocation for 0.3 MGD. Our Board has asked us to update OCEA's Facility Plan for the Floyds Fork Service area and to evaluate the following alternatives:

1. Louisville MSD Alternative - Convey the wastewater to Floyds Fork WWTP based on MSD's referenced capacity fees and treatment costs.
2. Regional Treatment Alternative - Construct a new wastewater treatment plant on the grounds of the Women's Prison in Shelbyville to treat sewage for the Women's Prison, Country Village WWTP and the Ash Avenue WWTP service areas.
3. Ash Avenue WWTP Alternative: Renovate/Replace and expand at the site of the existing Ash Avenue WWTP to provide treatment for the Country Village WWTP and Ash Avenue service area.

We would like to request a waste load allocation for these alternatives so we can evaluate the Facility Plan alternatives identified above, along with a no-action alternative. It will be necessary for us to have preliminary effluent limits so we can establish the scope of the projects, costs and estimate the user fees and capacity charges. Once we complete the alternative evaluations, we will present our recommended plan to the Division of Water, elected officials and conduct the required Regional Facility Planning public hearings.

The locations we are requesting WLA determinations is as follows:

Alternative 1 - Louisville MSD Alternative: We will use the effluent limits presented in the Division of Water's, December 1, 2008 WLA letter to MSD as the effluent treatment standard for this alternative unless you provide updated limits.

700 W. Jefferson Street
Lagrange, KY 40031

502-225-9477 Phone
502-225-9468 Fax

Draft May 1, 2012

Alternative 2 – Regional Treatment Alternative: We are requesting a WLA for a treatment capacity of 0.706 mgd at the existing outfall location for the Kentucky Women's Prison WWTP. The approximate location is latitude and longitude 38°28'56.75" North and 85°46'22.55" West, at mile point 46 on Floyds Fork Creek. A treatment capacity of 0.706 mgd will allow OCEA to regionalize treatment of the following facilities.

- Ash Avenue WWTP – 0.3 mgd
- Country Village WWTP – 0.046 mgd,
- Women's Prison WWTP – 0.14 mgd
- Future Growth – 0.2 mgd.

Alternative 3- Existing Ash Avenue WWTP Alternative: We are requesting a WLA for a treatment capacity of 0. 566 mgd at the existing outfall location, Permit no. KY0024724, located at mile point 0.54 to Floyds Fork at mile point 45.57. A treatment capacity of 0.566 mgd will allow OCEA to consolidate treatment of the Ash Avenue and Country Village WWTP and provide 0.2 mgd of capacity for future growth.

A USGS map showing the locations of the proposed discharge points is attached. Once we have been provided the preliminary WLA, we will develop and submit an updated Regional Facility Plan for this area and address the additional information referenced in 401 KAR 5:005, Section 3, Construction Permit Supporting Information and 401KAR 5:006 Wastewater Planning Requirements.

If you have any questions do not hesitate to contact me at 502-225-9477.

Sincerely,

Ed Basquill
Project Manager, Oldham County Sewer District/Veolia Water

700 W. Jefferson Street
Lagrange, KY 40031

502-225-9477 Phone
502-225-9468 Fax

Oldham County Environmental Authority
Operated by VEOLIA WATER

August 13, 2012

Anshu Singh
Division of Water
200 Fair Oaks Lane
Frankfort, Kentucky 40601

Re: Waste Load Allocation & Facilities Plan

Ms Singh:

Thank you for your assistance in getting our first public meeting for the Facilities Plan published on the Division of Water website. The meeting is rapidly approaching, and will occur in just two short weeks. There are two matters we need to clear up which require your help

WLA

We are in receipt of your email that was designed to address our waste load allocation request for a treatment plant discharging into Floyd's Fork. As I understand the technical discussion in the email, you provided some planning level effluent limits but concluded you could not provide an answer on the WLA and recommended that we delay the development of the South Floyds Fork Planning Area Facility Plan and wait for completion of the Floyds Fork TMDL. Having been involved in our enforcement negotiations to date, I'm sure you understand that we can't wait

I've asked our planning consultant, Jim Hagerty, P E. to prepare a memo documenting our need for the WLA for the facilities plan evaluations and recommend planning level effluent limits consistent with the methodology that you have used in the email and to provide effluent limits to MSD and LaGrange Utility Commission for their treatment plant expansions. I have included his memorandum and recommended effluent limits as an attachment for your review and approval

Willow Creek and Orchard Grass WWTP Elimination and Public Hearing

As of today, we do not have rates from MSD for regionalizing treatment at the Hite Creek or Floyds Fork WQTC nor do we know if they will indeed accept flow from OCEA at any rate. It is imperative that we proceed with the Facilities Plan efforts and proceed with the necessary capital projects to eliminate the Willow Creek and Orchard Grass WWTP or we may lose funding and face additional enforcement actions. For Willow and Orchard Grass WWTP elimination, the options are for OCEA to build a new regional plant or convey to MSD Hite Creek. The only viable option we have information to evaluate is the new plant on Hites Creek. To a non-engineer, it is difficult to understand why a facilities plan is even needed to evaluate one option.

Please review the attached information and advise us how you would like us to proceed. Our engineers and staff are willing to meet with you this week or at your earliest convenience to discuss further.

Sincerely,

Horace Harrod

Horace Harrod
Chairman, Oldham County Environmental Authority

700 W. Jefferson Street
Lagrange, KY 40031

502-225-9477 Phone
502-225-9468 Fax

Hagerty Consulting, L.L.C.

Memo

To: Ed Basquill

From: Jim Hagerty

Date: 8/13/2012

Re: Wasteload Allocations for Facility Planning – Crestwood and South Floyds Fork Planning Areas

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As requested, I have reviewed comments from Anshu Singh, Division of Water (DOW) on Oldham County Environmental Authority's (OCEA), Wasteload Allocations Request (WLA). The comments were in response to OCEA's, WLA for the South Floyds Fork Planning Area that was submitted to Mr. Jory Becker, DOW on April 19, 2012. As you and I have discussed, OCEA is not in a position to delay the development of a regional facility plan for the South Floyds Fork Planning Area due to:

- The Ash Avenue WWTP and its service area are under a sewer-connection moratorium. The moratorium is impacting economic development in this planning area and delaying construction in approved housing developments and commercial areas. OCEA is responsible for providing sewer capacity in the planning area to support economic development.
- The Department of Enforcement has requested OCEA to provide a plan and schedule for eliminating the Ash Avenue and Country Village treatment facilities and we need to develop a plan of action through the facility planning process to meet this requirement.
- The Department of Corrections has asked OCEA to consider alternatives that would allow them to eliminate their WWTP at the Institute for Women. The existing Ash Avenue WWTP does not have the capacity to receive flows from the Institute.
- The Ash Avenue WWTP is 40+ years old and is not adequately sized to store or treat wet weather flows. A solution that will allow OCEA to replace and expand the facility is necessary to eliminate the sewer overflows and meet effluent treatment standards.

The DOW regulations, requires all facility plans to follow the requirements outlined in the Regional Facility Plan Guidance Document, 2010. In section 7 of this document, we are instructed to provide a copy of the waste load allocations issued by the Division of Water for

the selected alternatives. DOW response to the OCEA's, April 19, WLA request provides no alternative for addressing sewer service needs in the South Floyds Fork Planning Area.

Neither is there a WLA for an alternative to convey the sewage to MSD's Floyds Fork WQTC. The State Planning and Environmental Assessment Report (SPEAR) issued March 30, 2011 for expansion of the Floyds Fork WQTC, from existing average daily flow of 3.5 mgd to 9.5 mgd did not include capacity for the Ash Avenue or the Institute for Women WWTP. If Ash Avenue and the Institute's WWTP flows are added to the Floyds Fork WQTC, the effluent standards for this facility will have to be lowered to maintain the same mass loading criteria that was used to approve the expansions.

Anshu Singh, August 10, 2012, email proposed effluent standards for the South Floyds Fork Planning Area based on maintaining existing, permitted mass loading and reducing effluent concentration, proportional to the increased in average day flow. This methodology is consistent with the methodology used to establish MSD's Floyds Fork WQTC effluent limits for expansion of the Floyds Fork WQTC from 3.5 millions of gallons per day (mgd) to 9.5 mgd.

My recommendation is for OCEA to request DOW confirm that the effluent limits defined below, are consistent with their criteria for permitting expansion of treatment capacity in the Floyds Fork Watershed and can be used to conduct the public hearing on August 27 and for evaluations of alternatives for the South Floyds Fork Planning Area.

The effluent limits that are proposed below have been developed based on maintaining existing, permitted mass loadings.

1. Louisville MSD Floyds Fork WQTC Alternative - Convey the wastewater to Floyds Fork WQTC based on MSD requested capacity fee and O&M costs.

    a. Annual Average Day Flows: 10.75 mgd

        i. 1.0 mgd from OCEA's South Floyds Fork Planning Area
        ii. 0.25 mgd from the Women's Prison
        iii. 9.5 mgd from MSD Floyd Fork WQTC Service Area

    b. Effluent Limits (milligrams per liter, pounds per day based on 10.75 mgd ADF)

        i. CBOD5 - 3.63 mg/l, 325.6 ppd
        ii. NH3-N - 0 60 mg/l (summer), 54.2 ppd
        iii. NH3-N - 1.81 mg/l (winter), 162.6 ppd
        iv. TP - 0.30 mg/l, 27.1 ppd

2. Regional Treatment Alternative - Construct a new wastewater treatment plant on the grounds of the Institute for Women to treat sewage for the Institute, Country Village WWTP and Ash Avenue WWTP and South Floyds Fork Planning Area. Return flow to the two existing permitted KPDES outfalls at Ash Avenue and the Institutes WWTP outfalls. Effluent limits for

this alternative will be based on the Ash Avenue WWTP, effluent limits since they are the most stringent.

a. Annual Average Day Flows: 1.25 mgd

   i. 1.0 mgd from OCEA's South Floyds Fork Planning Area
   ii. 0.25 mgd from the Women's Prison

b. Effluent Limits - Institute WWTP Outfall (milligrams per liter (mg/l,) pounds per day (ppd) based on 0.25 mgd Average Daily Flow (ADF))

   i. CBOD5 – 5.00 mg/l, 10.4 ppd
   ii. NH3-N - 1.00 mg/l (summer), 2.1 ppd
   iii. NH3-N - 2.50 mg/l (winter), 5.2 ppd
   iv. TP - monitor

c. Effluent Limits – Ash Avenue WWTP Outfall, (milligrams per liter, pounds per day based on 1.0 mgd ADF),

   i. CBOD5 - 3.00 mg/l, 25.0 ppd
   ii. NH3-N - 0.60 mg/l (summer), 5.0 ppd
   iii. NH3-N - 2.10 mg/l (winter), 17.5 ppd
   iv. TP - 0.30 mg/l, 2.5 ppd

3. Ash Avenue WWTP Alternative: Renovate/Replace and expand at the site of the existing Ash Avenue WWTP to provide treatment for the Country Village WWTP and South Floyds Fork Planning Area.

   a. Annual Average Day Flows: 1.00 mgd

      i. 1.0 mgd from OCEA's South Floyds Fork Planning Area
      ii. No flow from the Institute WWTP

   b. Effluent Limits – Ash Avenue WWTP Outfall (milligrams per liter, pounds per day based on 1.0 mgd ADF)

      i. CBOD5 - 3.00 mg/l, 25.0 ppd
      ii. NH3-N - 0.60 mg/l (summer), 5.0 ppd
      iii. NH3-N - 2.10 mg/l (winter), 17.5 ppd
      iv. TP - 0.30 mg/l, 2.5 ppd

The MSD/Oldham County Sewer District (OCSD) 2000-2020 Regional Wastewater Facility Plan, recommended alternative for the South Floyds Fork Planning Area, proposed conveying the wastewater the Crestwood Planning Area with an outfall to Hite Creek. This alternative should be reviewed in the new facility plan and a Wasteload Allocation should be requested from DOW for a new outfall to Hite Creek as specified below.

4. Crestwood and South Floyds Fork Planning Areas, Regional Wastewater Treatment Alternative: This alternative is based on providing regional treatment in the Crestwood planning area and discharging the effluent to Hite Creek. New pump stations and conveyance systems would be required at the Ash Avenue, County Village WWTP and Institute for Women to convey the sewage to the Crestwood Planning Area's wastewater treatment facility. The tankage at the existing wastewater treatment plants maybe renovated and used for wet weather storage in this alternative.

a. Annual Average Day Flows: 2.50 mgd

   i. 1.0 mgd from Crestwood Planning Area
   ii. 1.0 mgd from South Floyds Fork Planning Area
   iii. 0.25 mgd from the Institute WWTP

b. Effluent Limits – Hite Creek Outfall

   i. CBOD5 - 10.00 mg/l, 208.5 ppd
   ii. NH3-N - 2.00 mg/l (summer), 41.7 ppd
   iii. NH3-N - 5.00 mg/l (winter), 104.3 ppd
   iv. TP - 1.00 mg/l, 20.9 ppd

Jim Hagerty

From: "Jim Hagerty" <littlecreek50@insightbb.com>
To: <anshu.singh@ky.gov>; "Becker, Jory (EEC)" <jory.becker@ky.gov>
Cc: "Ed Basquill" <ed.basquill@veoliawaterna.com>
Sent: Thursday, August 16, 2012 2:40 PM
Attach: LetterToDOWAug2012.pdf
Subject: Oldham COunty Environmental Authority - Crestwood and South Floyds Fork Regional Facility Plan

Anshu/ Jory - You should have received the attached letter and effluent limit analysis that have been developed for several alternatives for the South Floyds Fork Planning Area. Over the next several weeks, OCEA will be developing these alternatives to determine treatment requirements and costs and conduct the present worth analysis required as part of the South Floyds Fork Regional Facility Plan.

The effluent standards proposed in the attached documents were developed to be consistent with Division of Water requirements that have been used in the Floyds Fork Watershed. We would like you to review these effluent standards and work with us to come to an agreement on preliminary effluent standards that can be used in the Regional Facility Plan analyses.

OCEA's Chief Financial Officer has stated in a recent Board meeting that they invested close to $300k to develop the June 2007 Regional Facility Plan which DOW could not approve. OCEA cannot afford to have a similar outcome to this planning effort and wants to work closely with you to establish alternative criteria that meets your water quality standards. It is critical that we have effluent standards consistent with DOW requirements so we can evaluate alternatives based on their required treatment processes, costs and merits.

We would like to meet with you on Thursday or Friday of next week to review the alternatives and make any changes necessary to comply with DOW effluent standards prior to the scheduled public hearing on Monday, August 27. Will 10 am on Friday, August 20, work for the meeting ?. If there is a better time on Thursday or Friday for the meeting, we can make arrangements to be in your office.

Yours truly

Jim Hagerty, P.E.
Hagerty Consulting, L.L.C.
Engineering Planning and Management
littlecreek50@insightbb.com
[P] 502.614-6322
[M] 502.548.0598

Steven L. Beshear
GOVERNOR

ENERGY AND ENVIRONMENT CABINET
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DIVISION OF WATER
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Leonard K. Peters
SECRETARY

R. Bruce Scott
COMMISSIONER

December 1, 2008

Mark J. Johnson, P.E.
Louisville Metropolitan Sewer District
700 West Liberty Street
Louisville, Kentucky 40203-1911

Re: Floyd's Fork Watershed Wastewater Facilities Plan
Waste Load Allocation Request
Floyd's Fork Wastewater Treatment Plant
KPDES No.: KY0102784
Jefferson County, Kentucky

Dear Mr. Johnson:

This is in response to Strand Associates, Inc. August 3, 2007 letter, requesting preliminary design requirements for expansion of the subject facility from 3.25 MGD to 6.5 MGD. Discharge from the wastewater treatment plant (WWTP) is to remain at mile point 37.6 of Floyd's Fork, segment 12027. The waste load allocation (WLA) information provided will be utilized in preparation of a Regional Wastewater Facilities Plan for the Floyd's Fork watershed.

As you are aware, EPA is currently involved in an effort to model the Floyd's Fork watershed. The results of this modeling will be utilized as a basis for determining what modified waste load allocations, if any, are available for pending WLA requests impacting the watershed. However, until modeling is complete, the requirements of the approved Total Maximum Daily Load (TMDL), "Development of an Ultimate Oxygen Demand (UOD) TMDL for Floyd's Fork and its Tributaries", must be considered in establishing effluent limitations for any new or expanding WWTP impacting the Floyd's Fork watershed.

Considering the provisions of the approved TMDL, limitations for an expanded Floyd's Fork WWTP are based on maintaining the existing pollutant load, and were calculated based on a design flow of 6.5 MGD. The division acknowledges your request of October 15, 2008, requesting limits based on 9.75 MGD and remains open to watershed based strategies for water quality improvement that will accommodate such an expansion.

Based on the aforementioned information, following are effluent limitations applicable to the design of the expanded wastewater treatment facility:

Design Capacity = 6.5 MGD

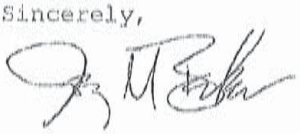
	May 1 – October 31	November 1 – April 30
$CBOD_5$	6 mg/l	6 mg/l
Total Suspended Solids	30 mg/l	30 mg/l
Ammonia Nitrogen	1 mg/l	3 mg/l
Dissolved Oxygen	7 mg/l	7 mg/l
Total Residual Chlorine	0.011 mg/l	0.011 mg/l
Total Phosphorus	0.5 mg/l	0.5 mg/l
Total Nitrogen	Monitor, mg/l	Monitor, mg/l
Toxicity	1 TUc	1 TUc

In addition to the above requirements, the monthly average and weekly maximum values of E. coli shall be at or below 130 colonies per 100 milliliters or 240 colonies per 100 milliliters, respectively, the year around. If a form of chlorine is proposed for use to disinfect the wastewater, then de-chlorination will likely be needed to achieve the chlorine residual and toxicity limits. As discussed in the meeting between MSD and the Division of Water on October 1, 2008, the Total Phosphorous limit provided is for design considerations due to the fact that there is no current water quality criterion for nutrients, and no nutrient TMDL developed for Floyd's Fork. Preliminary data indicates that a numeric water quality criterion for this water body will be between 0.4 and 0.6 mg/l, however, these studies are pending completion. Once the division establishes the criterion, the KPDES permit for this facility will be re-opened to implement this limit in the form of a Water Quality Based Effluent Limitation (WQBEL). Additional effluent limitations and water quality standards are contained in the Division of Water Regulations.

Please note that this letter does not convey authorization or approval to proceed with the construction or operation of the proposed wastewater treatment plant. Construction and KPDES permit applications must be submitted to request such authorization or approval. Nor does this letter ensure the issuance of either permit. During the review processes of these permits the Division of Water will further evaluate the viability of the project.

Should you have any questions regarding this matter, please contact me at (502) 564-3410, extension 4850 or E-mail at Jory.Becker@ky.gov.

Sincerely,



Jory M. Becker, P.E.
Environmental Engineer Branch Manager
Surface Water Permits Branch
Division of Water

JMB:

cc: Compliance and Technical Assistance
Branch, Louisville Section
Mr. Mark A. Sneve, Strand Associates Inc.

APPENDIX 1-3

OCEA Letter to Peter Goodman, documenting Requested Capacity from MSD at the Hite Creek and Floyds Fork Planning Areas

Oldham County Environmental Authority
Operated by Veolia Water

August 17, 2011

Peter Goodmann
Assistant Director
Kentucky Division of Water
300 Fair Oaks Drive
Frankfort, KY

Re: Orchard/Willow WWTP Elimination

Negotiations
Mr. Goodmann:

Thank you for facilitating the meeting between OCEA and MSD. The outcome of our meeting (held Friday August 12, 2011 at DOW) was for OCEA to document for MSD what capacity OCEA needed and when it was needed.

The table below summarizes our future needs.

Year	OCEA needs (MGD)	Source of Estimate	Certainty/Risk
0	0.5	Operating data	100 percent needed
2	0.6	Joint Facilities Plan between MSD and OCSD (2007)	Dependent upon economic conditions and if MSD takes Ash Ave to Floyds Fork
5	1.0		
10	1.3		

If you have any questions do not hesitate to contact me at 502-225-9477.

Sincerely,

Ed Basquill
Project Manager, Oldham County Environmental Authority

Cc: Gary Levy, Courtney Seitz, Jory Becker, Mark Johnson, Brian Bingham, Jeff Cummins, Anshu Singh, Shafiq Amawi, Horace Harrod, Ernie Hall, Jim Hagerty

APPENDIX 1-4

OCEA Letter to Brian Bingham, MSD Requesting Regional Treatment Capacity for the Crestwood and Floyds Ford Planning Areas

Oldham County Environmental Authority
Operated by VEOLIA WATER

June 18, 2012

Brian Bingham
Regulatory Director
Metropolitan Sewer District
700 West Liberty Street
Louisville, KY 40203

Re: **Treatment of Wastewater from Oldham County Environmental Authority (OCEA) Crestwood and Floyds Fork Service Areas**

Dear Mr. Bingham:

I have been working with you and previously Mark Johnson, to determine the terms under which MSD would agree to accept wastewater flow from our three packaged plants in the Crestwood and Floyds Fork service areas and want to thank you for the time invested in our discussions. We have met in-person at least 8 times over the last several months to discuss terms of an agreement.

OCEA and MSD have contemplated for many years a regional approach in the Crestwood and Floyds Fork Service Areas, where wastewater from OCEA's existing packaged plants would be pumped to MSD's Hite Creek or Floyd's Fork Water Quality Treatment Facilities. In 2000, MSD and OCEA submitted a Joint Facilities Plan to the Kentucky Division of Water that established a 5-year timeframe for flows from these three package plants to be routed to the MSD's Water Quality Treatment Facilities. Of course, this assumed that terms of such an arrangement could be worked out between the OCEA and MSD.

Twelve years have now passed and the OCEA is facing possible crippling civil penalties if we do not complete planning and begin constructing the required facilities to close the packaged plants in these two service areas. The two options that are considered feasible by OCEA for accomplishing these goals are:

- Completed negotiations on a Regional treatment arrangements with MSD as recommended in the 2000 Joint Facility Plan
- OCEA build new regional wastewater treatment facilities in the Crestwood and Floyds Fork Service areas.

Concurrent with our discussions, we have continued with the required engineering and facility planning activities necessary to construct new regional wastewater treatment facilities in the Crestwood and Floyds Fork service areas. It is our responsibility to pursue both options until we have completed and our Board approves implementation of one of the two options presented.

OCEA has received a waste load allocation from Division of Water (DOW) to construct a new regional facility along Hite Creek and we have requested funding from the Kentucky Infrastructure Authority ("KIA") but the Kentucky Division of Water opposed our financing request on the basis that the OCEA has not adequately considered the option of working with MSD to accept flow from the plants.

700 W. Jefferson Street
Lagrange, KY 40031

502-225-9477 Phone
502-225-9468 Fax

Oldham County Environmental Authority Operated by VEOLIA WATER

We communicated to the Division of Water and KIA that we are in favor of the regionalization of wastewater treatment, however, we are unable to consider that option without a firm commitment from MSD on: 1) its willingness to accept flow from the plants, and 2) what charges the OCEA will incur as a result of such an arrangement and when they will be due

Recognizing the quandary we are in, the KIA board requested that we inform MSD of the urgency of our need for MSD to convey its willingness to accept this flow (and expected future increases), and if it will, the terms under which it would accept the flow and update them on our discussions at the August KIA board meeting.

The attached table contains what I understand from our conversations is the amount of flow that MSD will accept and the rate structure, as compensation for accepting these flow. These terms have been conveyed only verbally and there are still outstanding rate assumptions and conditions that have not been established. I am writing to request that MSD confirm these terms in writing or convey in writing any different terms that MSD would accept within the next 45 days.

I hope that you recognize the urgency of our situation. I would like to thank you in advance for your assistance with this matter. We are available to meet with you to finalize our discussion at your earliest convenience. If you have any questions do not hesitate to contact me at 502-645-3555.

Sincerely,

Horace Harrod

Horace Harrod, Chairman Oldham County Environmental Authority

Rate Structure	Rate	Comments
Capacity Fee ($/gallon)	$7.84	Discussions with Brian
Treatment Rate	-	Not established
Equipment Maintenance and Asset Renew Costs	-	Not Established
Annual Increase in Variable Costs – annual	3%	Discussions with Brian
Metered Costs - $/1000 gallons	$3.35 to $4.00	All inclusive rate including capacity fee amortized over 30 years
Flow Commitment – gallons	1,000,000	
Acceptable Peak Flow Rates	-	Not established

CC: KIA Board, DOW Enforcement, OCEA Board, Greg Heitzman, Honorable Judge Executive Voegele

700 W. Jefferson Street
Lagrange, KY 40031

502-225-9477 Phone
502-225-9468 Fax

APPENDIX 1-5

OCEA Regional Facility Plan, KDOW Facility Plan
Kick-off Meeting Minutes

HAGERTY CONSULTING, L.L.C.
ENGINEERING, PLANNING & MANAGEMENT

Memo

To: Meeting Attendee

From: Jim Hagerty

CC: OCEA Board

Date: 7/3/2012

Re: Division of Water – Regional Facility Plan Kick-Off Meeting

---

Oldham County Environmental Authority (OCEA) would like to thank everyone in attendance for meeting with us and providing guidance on the development of the Regional Facility Plan. Attendees are listed on the attached attendance sheet.

OCEA service area is comprised of 4 planning areas that are designated as:

1. KSR Planning Area
2. Ohio River Planning Area
3. Crestwood Planning Area
4. South Floyds Fork Planning Area

Background and Purpose

OCEA is in final discussions with the Department of Enforcement (DOE) on the language of the agreed order related to the ongoing enforcement action. DOE has stated that the top priorities of the agreed order will include elimination of Sanitary Sewer Overflows and the existing Orchard Grass, Willow Creek and Ash Avenue wastewater treatment plants.

Accomplishing these goals will require the expansion or construction of new treatment capacity in the Crestwood and Floyds Fork Planning Areas. The Division of Water (DOW) regulations that govern planning for the construction or

expansion of treatment capacity are defined in 401 KAR 5:006. In accordance with these regulations, a pre-planning meeting with the DOW was scheduled and conducted on June 22, 20121. The meeting discussions are summarize in the following sections.

Facility Planning Requirements

DOW informed OCEA that they would be receiving a letter establishing dates for submitting updated regional facilities plans. The DOW planning regulations require either a new regional facility plan or an asset report be submitted every ten years and the last approved plan was submitted and approved by DOW in 2002/03 timeframe. OCEA stated that they have reviewed the regulations and were planning on submitting an updated regional facility plans for the Crestwood and South Floyds Fork Planning Areas and will be submitting asset reports for the Ohio River and KSR Planning Areas.

Facility Plan Kick-Off Meeting

Discussions were held related to the alternatives that will be evaluated for providing sewer service and complying with the requirements as discussed with DOE related to the Crestwood and South Floyds Fork Planning Areas. These are the planning areas where the Orchard Grass, Willow Creek and Ash Avenue wastewater treatment plants are located. OCEA presented the list of preliminary options for the alternative evaluation:

Crestwood Planning Area

1. Do Nothing Alternative
2. Hite Creek Water Quality Center Expansion Alternative
3. New Regional Plant Alternative
   a. Orchard Grass, Willow Creek and future growth
4. Expansion of Existing Treatment Plants Alternative

Floyds Fork Planning Area

1. Do Nothing Alternative
2. Floyds Fork Water Quality Center Expansion Alternative
3. New Regional Plant Alternative
   a. Ash Avenue, Country Village and new growth

b. Ash Avenue, County Village, Women's Prison and new growth
c. Ash Avenue, Country Village, Women's Prison, new growth and other adjacent package plants, (see note 1)

4. Expansion of Existing Treatment Plants Alternative

Note 1: Alternative 3 (c) will be developed and evaluated if after meeting with the adjacent sewer authority there is interest in the OCEA providing regional treatment capacity.

Discussions were held related to Cross-Cutter Agency Reviews and the requirements to include environmental assessments for projects that are to be implemented in the one to two-year planning period. DOW commented that the Facility Planning and State Planning and Environmental Assessment Report (SPEAR) approval is applicable for a 5-year period from approval.

The facility plan can be developed using a 10 or 20 year planning horizon and an implementation plan should be provided for all projects that are recommended in the one to five year planning period. DOW recommended that OCEA use the Regional Plan Completeness Checklist and Forms included in Section 12 of the Regional Facility Plan Guidance, 2010 document as the table of content for developing the facility plan.

Discussions were held related to the public participation requirements for the Facility Plan. The regulations require a minimum of one public meeting to present the plan recommendations and rate analysis. The meeting must be advertised in a newspaper and OCEA must take measures to solicit public participation in the development of the plan. DOW recommended that OCEA conduct a minimum of 2 public meetings with the first meeting designated to discuss the alternatives that will be evaluated.

Once the facility plan is complete and the public hearing is held in the local community, an electronic copy must be submitted to DOW for public notice and review during the public and agency comment period.

Wasteload Allocation Request - South Floyds Fork Planning Area

OCEA submitted a wasteload allocation request for the South Floyds Fork Planning Area and the Ash Avenue wastewater treatment plant on April 19, 2012. WLA allocations were requested for the following alternatives:

1. Louisville MSD Alternative - Convey the wastewater to Floyds Fork WWTP based on MSD's referenced capacity fees and treatment costs.
2. Regional Treatment Alternative - Construct a new wastewater treatment plant on the grounds of the Women's Prison in Shelbyville to treat sewage for the Women's Prison. Country Village WWTP and the Ash Avenue WWTP service areas.
3. Ash Avenue WWTP Alternative: Renovate/Replace and expand at the site of the existing Ash Avenue WWTP to provide treatment for the Country Village WWTP and Ash Avenue service area.

Receiving DOW's determination of treatment requirements for the planning area is a key element necessary to develop and implement regional treatment alternatives. DOW stated that they have established WLA requirements for the MSD's Floyds Fork WWTP based on maintaining the existing mass loading to Floyds Fork Creek. OCEA stated that establishing new treatment standards for the planning alternatives based on maintaining existing mass loadings or establishing the same effluent treatment standards provided to MSD would be acceptable approach. Providing the same treatment standards for both MSD and OCEA would provide an added benefit by establishing the same standards and environmental protections for all the alternatives that are being considered for the Floyds Fork watershed.

Septic Tank Management Plan

Discussions were held related to the proposed Septic Tank Management System project that has been submitted to DOW for consideration as a SEP (Supplementary Environmental Project) and how the project will benefit Oldham County. OCEA explained the goals of the project as:

1. Develop GIS inventory and map of septic tanks in OCEA service area.
2. Conducting environmental reviews of soil and water quality in septic tank areas to provide data for a more definitive assessment of septic tank impacts, if any.
3. The septic tank inventory and environmental assessment will allow OCEA to develop management strategies to mitigate and/or reduce the impact of septic tanks in OCEA's service areas.

4. Assist OCEA to prioritize areas where sewer construction will benefit water quality and environmental management. Sewer construction assessments will be developed in high priority areas and presented to the homeowners for approval.
5. In priority areas, appropriate septic tank management strategies will be developed for monitoring and inspecting septic systems.

OCEA stated that the Septic Tank Management System would benefit the county and the environment by providing more definitive information on the number, location and management strategies for the estimated 5000 to 7000 septic tanks in Oldham County. Having this information is critical to OCEA and will assist in the development of effective septic system management procedures and priority action plan to provide sewers to area where septic systems are causing water quality impacts.

APPENDIX 1-6

OCEA Meeting Summary from Facility Plan

Public Meeting, August 27, 2012

Oldham County Environmental Authority operated by VEOLIA

Meeting Summary- Facilities Plan Public Meeting August 27, 2012

A public meeting was held on August 27, 2012 at the Oldham County Environmental Authority (OCEA) Office at 700 West Jefferson Street. The meeting was open to the public and advertised in the Oldham Era. The purpose of the meeting was to solicit public input with regard to the alternatives for capital improvements being evaluated in the Facilities Plan. Am additional public meeting is required by statute where selected alternatives are presented before a facilities plan can be approved. This was not a required by statute meeting and no alternatives had been selected. This was a preliminary meeting to solicit public input and have the most open and transparent process possible. The required meeting was not yet scheduled but would probably occur in November of 2012.

In Attendance:

Jim Griffin	OCEA board member
Ed Basquill	Manager for OCEA
Jim Hagerty	Hagerty Consulting
Shafiq Amawi	Kentucky Division of Water
Vicki Coombs	MSD of Louisville
Alex Novak	MSD of Louisville
Mark Ralph	Tetratech
William Marshall	Stantec
Ken Tran	Strand
Virgil Dempsey	Willow Creek
Bob Rogers	Pee Wee Valley
Pam Isaac	Crestwood

Presentation of Options

Ed Basquill, PE explained the purpose for the meeting, and covered the purpose of the facilities planning process. He described the different facilities planning areas covered by OCEA, and how this meeting was focused on Facilities Planning for the Crestwood service area and the South Floyd's Fork service area. Jim Hagerty, PE of Hagerty Consulting explained the different options being evaluated for the service areas. He also showed how the options were related to prior studies in the last approved facilities plan. A PowerPoint presentation summarizes what was presented and is attached to this summary.

Public Feedback

Virgil Dempsey of Willow Creek commented on the ongoing work underway in Willow Creek subdivision. He mentioned that he thought that all of this was supposed to happen 20 years ago. Ed Basquill mentioned that funding was now in place to proceed, and that despite improvements in compliance the facilities (like the Willow Creek WWTP) were sell past there service life and that we were ready to proceed.

There was discussion about the option on the South Floyd's Fork Service area option to build a facility jointly with the Pee Wee Valley. Pam Isaac (resident of Crestwood) was concerned about Oldham County expanding into Shelby County. She thought Shelby County should take care of itself. Ms. Isaac said that she thought we were doing this to try to expand and make more money.

Ed Basquill explained in more depth what the alternative being studied entailed. The Ash Ave WWTP is 35 years old, 0.3 MGD and over capacity. The Pee Wee Valley Women's prison has a 0.15 MGD WWTP less than half a mile from Ash Ave, and is looking to double in capacity. Both plants need to be eliminated. With economies of scale, both parties contributing to a single solution could be a win for the rate payers and was worthy of evaluation as an alternative.

Bob Rogers of Pee Wee Valley commented that he thought taking the waste for Ash Ave in that direction and not transiting through Pee Wee Valley would be a good thing.

Ms. Isaac commented that she thought this was really all about corporations making money. She thought the real problem was near where she lived in the Lakewood Subdivision. She claims that the plant stinks all of the time and that we never should have let the school be built and tap on to it years ago.

Ed Basquill explained that Lakewood WWTP was in compliance with its permit with the exception of severe wet weather conditions, when it was overcapacity with infiltration and inflow. He described the compliance improvements made in the last 3 years. The regional plan as well as the negotiations with the Division of Water called for 11 of the 13 treatment plants in Oldham County to be eliminated. The most severe compliance problems were to be addressed first. The two worst problems 3 years ago were the Green Valley WWTP and Buckner Municipal WWTP. Green Valley WWTP was eliminated earlier this year, and Buckner WWTP will be eliminated later this year. Covered Bridge WWTP and Willow Creek WWTP will also be addressed later this year. The two worst problems left for OCEA were Orchard Grass WWTP and Ash Ave WWTP.

Pam Isaac asked to know when Lakewood WWTP was slated for elimination. Ed Basquill said it was not part of this study. We were in compliance negotiations with the Division of Water to determine the dates. A date could not be given without the assent of the Division of Water and acceptance of OCEA leadership of the rate impacts. The elimination had a cost associated which needed to be balanced against the risks of leaving it online and other factors. Ms. Isaac left the meeting.

There were no further questions. The meeting concluded.

Summary Prepared by:

Ed Basquill

Oldham County Environmental Authority

Facilities Plan

1

Facilities Plan Public Meeting

Purpose of the meeting- to inform the public of our planning efforts and to solicit feedback

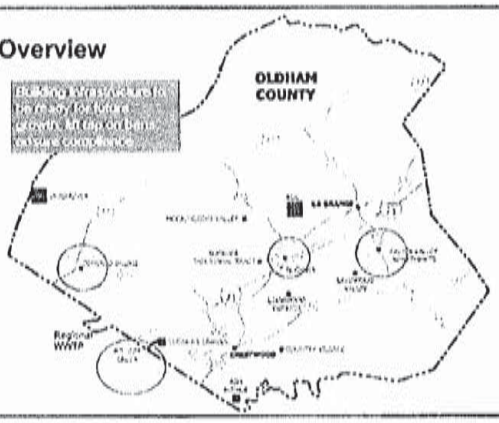
2

Facilities Plan

- What
- Where
- How
- Why

3

Overview

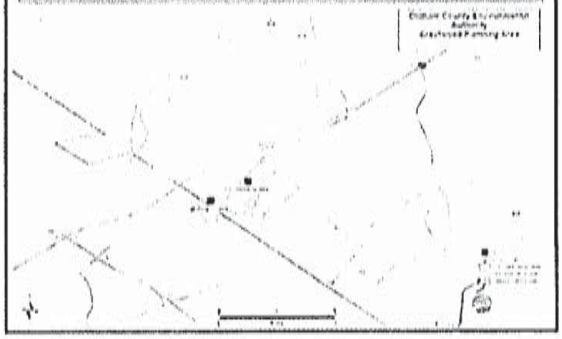


Facilities Plan

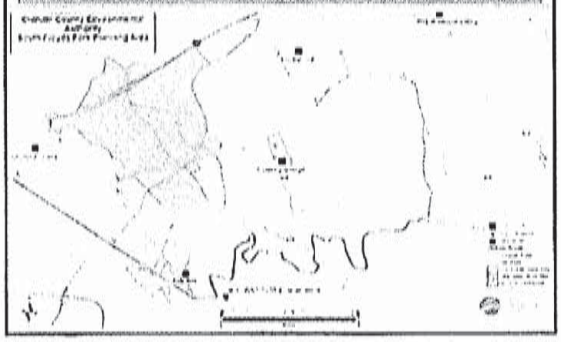
- What- a study to determine best option for the future of sewer facilities. Required by KY Division of Water
- Where- South Floyd's Fork and Crestwood Planning Areas
- How- Capital improvements

6

Crestwood



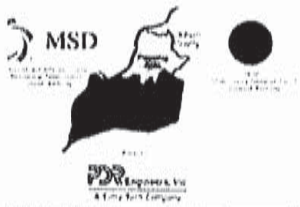
South Floyd's Fork



Why

- Provide a compliance schedule for pending agreed order that is focused on regionalizing to eliminate Orchard Grass, Willow Creek, and Ash Ave WWTP's
- To replace aging infrastructure
- Provide capacity to end tap on bans and to allow economic development in compliance with county comprehensive plan

MSD/OCSD



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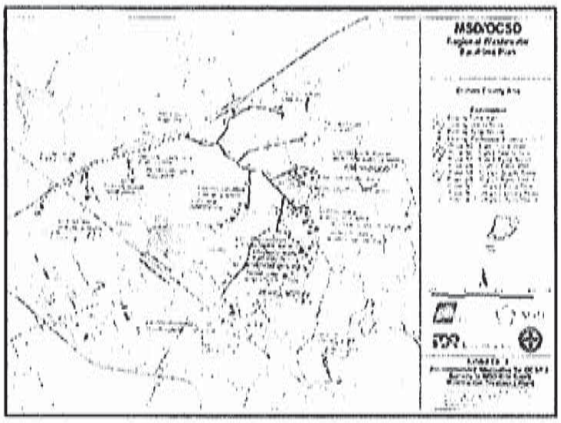
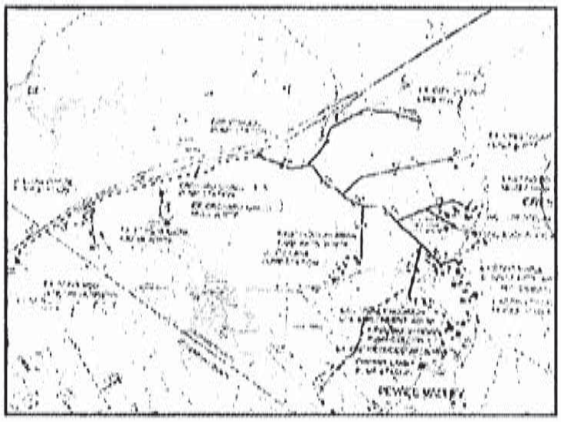


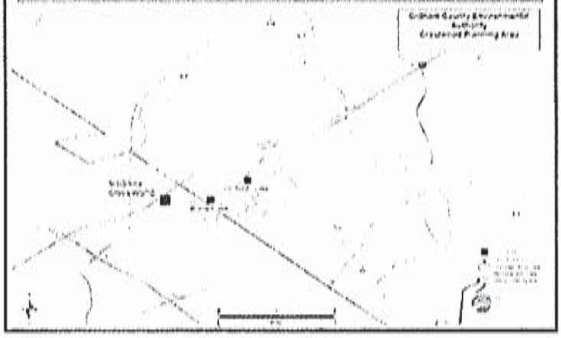


Crestwood Alternatives

- Alternative 1- Renovate and expand current facilities
- Alternative 2- MSD Hite Creek
- Alternative 3- New Regional Plant

12

Crestwood



South Floyd's Fork Alternatives

Alternative 1- Ash Ave Regional WWTP

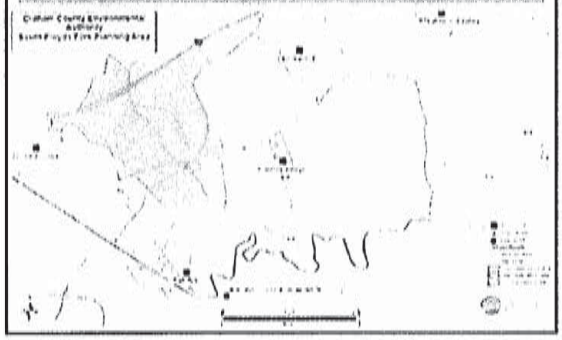
Alternative 2- Connect to MSD Floyd's Fork WQTC

Alternative 3- New Regional Plant at Institute for Women

Alternative 4- Convey to Regional Facility in Crestwood

14

South Floyd's Fork



Next Steps

- Completion of Draft Facilities Plan (Oct 2012)
- Presentation of recommended alternative to OCEA Board (Oct 2012)
- Public Hearing on recommended plan (Nov 2012)
- Begin Implementation

Questions?

Thank You

APPENDIX 1-7

OCEA Board Workshop, Regional Facility Plan
Summary, October 4, 2012

Oldham County Environmental Authority Operated by Veolia Water

SPECIAL BOARD MEETING AGENDA

October 4, 2012 @ 3:30 P.M.

CALL TO ORDER

1. Crestwood and Willow Creek Regional Facility Plan -- 30 min

   a. Updated Flow Projection

   b. Updated Summary of Alternatives Present Worth and Annualized Costs

   c. Construction Phases and Implementation Plan for Selected Alternative - New Orchard Grass Regional WWTP

   d. Projected Revenue Requirements and Cash Flow Analysis

   e. Division of Water Submittal

2. Board Approval- Task order for Abbott Lane

3. Public Comment –

Announcement of Next Meeting Date – October 18, 2012

EXECUTIVE SESSION

This session is called pursuant to KRS 61.815 et seq. The closed session concerns exceptions outlined in KRS 61.810(1)(c) allowing for discussion of proposed or pending litigation by a public agency to be conducted in private session.

AD JOURNMENT

Oldham County Environmental Authority Operated by Veolia Water

MINUTES FOR THE OCTOBER 4, 2012 SPECIAL BOARD MEETING

The Chairman, Horace Harrod, called the meeting to order at 3:30 p.m. Present were Board Members, James Griffin and Art Henson, and from Veolia Water – Ed Basquill, Kevin Gibson, and Andrea Matz.

1. **Board Approval Request – Gresham Smith Engineering, Task Order 14, Abbott Lane**

Motion made by Horace Harrod and seconded by Art Henson to authorize the execution of Gresham Smith Engineering Task Order 14 for engineering and property acquisition services for the Abbott Lane Stormwater Quality Improvement Project in the amount of $24,445 . Motion carried unanimously.

2. **Crestwood and Willow Creek Regional Facility Plan**

   Jim Hagerty, Hagerty Consulting LLC, reviewed several options for the Crestwood and Willow Creek planning areas, including flow projections, cost and revenue, and cash flow analysis. Mr. Hagerty explained that due to negotiations with the Kentucky D.O.W. we know they will require plants to be decommissioned. Therefore, OCEA is exploring several options such as building a new regional plant, sending flow to MSD, or partnering with others to ensure the best outcome for the County and its rate payers.

   The Chairman then advised everyone in attendance that the Board would need to have discussion during Executive Session concerning legal issues, but would reconvene in public session afterwards to take action.

3. **Public Comment** – Virgil Dempsey, resident and HOA President of the Willow Creek subdivision commented at various times during the meeting with the Board's consent, and during public comment time noted that if OCEA built a new regional plant a lot of new customers would offset the expense.

Announcement of Next Meeting Date – The Chairman announced the next regular monthly meeting is scheduled for Wednesday, Aug. 15, 2012 at 3:00 p.m.

The Chairman then reiterated that an Executive Session will be held to discuss legal issues but action will likely take place after reconvening the regular public session.

Adjournment – *Motion made by James Griffin and seconded by Art Henson to adjourn this portion of the regular public session at 4:55 p.m. Motion carried unanimously.*

The Chairman called the regular monthly public meeting back to order at 5:53 p.m.

Motion made by Art Henson and seconded by James Griffin to proceed with the alternative to build a new wastewater treatment plant in the Orchard Grass/Willow Creek area, and requested Jim Hagerty to return with an indepth cash flow and rate analysis. Motion carried unanimously.

Motion made by Horace Harrod and seconded by James Griffin to adjourn the meeting at 6:03 p.m.

Minutes respectfully submitted by Andrea Matz, Veolia Water N.A.

Oldham County Environmental Authority Operated by VEOLIA WATER

BOARD MEETING AGENDA

September 20, 2012 @ 3:00 P.M.

CALL TO ORDER

1. Minutes - August 16, 2012 - Regular Board Meeting

2. Treasurer's Report and Payables Request
   - Oldham County Stormwater
   - Oldham County Sewer

3. Public Comment – 1

4. Operations / Capital Report
   - Facilities Plan – Presentation by Jim Hagerty, P.E. (approx. 1 hr)
   - KIA Assistance Agreement – Covered Bridge Project
   - Abbott Lane Project Discussion and Easement Agreement

5. Correspondence Review

6. Public Comment – 2

Announcement of Next Meeting Date – October 18, 2012

EXECUTIVE SESSION

This session is called pursuant to KRS 61.815 et seq. The closed session concerns exceptions outlined in KRS 61.810(1)(c) allowing for discussion of proposed or pending litigation by a public agency to be conducted in private session.

AD JOURNMENT

APPENDIX 1-8

Department of Corrections to OCEA, Requesting Regionalization Opportunities Investigation

DEPARTMENT OF CORRECTIONS

Steve Beshear
Governor

Adult Institutions
P.O. Box 2400
Frankfort, Kentucky 40602-2400
Phone: 502-564-2220
Fax: 502-564-3520

LaDonna Thompson
Commissioner

Jim Erwin
Deputy Commissioner

October 18, 2012

Chairman Horace Harrod
Oldham County Environmental Authority
700 West Jefferson Street
LaGrange, KY 40031

Honorable Chairman Harrod:

Thank you for meeting with the Department of Correction Capital Construction Management Branch and our consultant, Jeffrey Lee on August 31, 2012. I am writing this letter to confirm our request that Oldham County Environmental Authority develop a proposal for taking over operations of the Kentucky Correctional Institution for Women's Wastewater Treatment Plant with a design capacity of 120,000 gallons per day and investigate alternatives during development of your Regional Facility Plan for providing treatment capacity for the Institution and eliminating our exiting treatment plant.

We are requesting OCEA to develop alternatives, facility requirements and costs for providing the Institution an annual average day capacity of 200,000 gallons per day of treatment capacity.

Once you complete your review of our existing facility and develop a cost proposal and terms for assuming operations of the Institution's existing treatment plant, we will schedule a follow-up meeting to begin development of the necessary agreements.

Please call me at 502-564-2094 x227 if you need to discuss our request.

Yours truly,

Gunvant C. Shah
by Sharon M. Spruce

Gunvant C. Shah, P.E.
Branch Manager
Capital Construction Management Branch

APPENDIX 1-9

Cross Cutter Agency Approval Letters

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, LOUISVILLE
CORPS OF ENGINEERS
P.O. BOX 59
LOUISVILLE KY 40201-0059
FAX: (502) 315-6677
http://www.lrl.usace.army.mil/

November 19, 2012

Operations Division
Regulatory Branch (South)

Mr. James Hagerty
Hagerty Consulting, LLC.
P.O. Box 459
Goshen, Kentucky 40026-0459

Dear Mr. Hagerty:

This letter is in regard to your request dated October 31, 2012, for an environmental review of the proposed sewer improvements in Oldham County, Kentucky. The environmental review requested is not an action usually completed by the Louisville District U.S. Army Corps of Engineers. A list of environmental consultants that perform the type of environmental reviews stated in your letter can be found on the Louisville District U.S. Army Corps of Engineers website.

I have enclosed a Department of Army Permit Application for your convenience. Please submit this application if your proposed project will impact "waters of the United States (U.S.)." Impacts may include mechanized clearing of wetlands and/or the placement of dredge/fill material into "waters of the U.S." If necessary, a pre-application meeting in the Louisville District office with a Corps of Engineers representative can be scheduled to discuss your proposed project.

If you have any questions concerning this matter, please contact this office at the above address, ATTN: CELRL-OP-FS or call me at (502) 315-6689.

Sincerely,

Layna Thrush
Project Manager, South
Regulatory Branch

Enclosure

United States Department of Agriculture

NRCS Natural Resources Conservation Service

1925 Old Main Street
Suite 2
Maysville, KY. 41056
Ph: 606-759-5570

11/27/2012

To: James L. Hagerty, PE
Hagerty Consulting, LLC
P.O. Box 459
Goshen, KY 40026-0459

Re: Oldham Co. Environmental Authority (OCEA)
OCEA Regional Facility Plan

Mr. Hagerty,

The project, except the treatment facility, as stated in the request and indicated by the supplied map is within the boundaries of existing right-a-ways, or on sites previously disturbed. These areas are considered prior converted farmland and not impacting prime farmland or statewide important farmland. "This part of the determination does not apply to any lands beyond the boundary of the right-of-ways or previously disturbed areas not already designated as *Prior Converted*."

The treatment facility site had not been selected at the date of the request, only potential sites indicated. This will be addressed in a future request once the final site has been determined.

If this office may be of additional assistance, please do not hesitate to contact my office in Maysville Ky. or contact the NRCS District Conservationist at 502-222-5123.

Steve Jacobs
Resource Soil Scientist, NRCS, Maysville, KY.

cc: Kurt Mason, NRCS District Conservationist, Louisville, KY

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Kentucky Ecological Services Field Office
330 West Broadway, Suite 265
Frankfort, Kentucky 40601
(502) 695-0468

November 13, 2012

Mr. James L. Hagerty
Hagerty Consulting, LLC
P.O. Box 459
Goshen, KY 40026-0459

Re: FWS 2013-B-0070; Hagerty Consulting LLC, Oldham County Environmental Authority, OCEA Regional Facility Plan, located in Oldham County, Kentucky

Dear Mr. Hagerty:

Thank you for the correspondence of October 31, 2012 regarding the above-referenced project. The U.S. Fish and Wildlife Service (Service) has reviewed this proposed project and offers the following comments in accordance with the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*). This is not a concurrence letter. Please read carefully, as further consultation with the Service may be required.

In accordance with provisions of the Fish and Wildlife Coordination Act, the Service has reviewed the projects with regards to the effects the proposed actions may have on wetlands and/or other jurisdictional waters. We recommend that project plans be developed to avoid impacting wetland areas and/or streams, and reserve the right to review any required federal or state permits at the time of public notice issuance. The U.S. Army Corps of Engineers should be contacted to assist you in determining if wetlands or other jurisdictional waters are present or if a permit is required.

In accordance to section 7 of the ESA, the Service must consider the "direct effects", "indirect effects", and "cumulative effects" of the proposed project. "Direct effects" are the effects on listed species or critical habitat that occur at the time of construction activities. "Indirect effects" are effects on listed species or critical habitat that are caused by the action and are later in time but are still reasonably certain to occur. "Cumulative effects" are those effects on listed species or critical habitat for future activities and/or projects that are induced by the proposed project subject to consultation and that occur after that project is completed.

Based on the purpose of the proposed project, we believe that the proposed project may have "cumulative effects", as previously defined. Thus, future projects may be induced by the proposed project (*i.e.*; residential development, commercial development). Please inform us of all the cumulative effects that are likely to occur as a result of the proposed project, so that we may adequately analyze those effects.

In order to assist you in determining if the proposed project has the potential to impact protected species we have searched our records for occurrences of listed species within the vicinity of the proposed project. Based upon the information provided to us and according to our databases, we believe that two federally listed species have the potential to occur within the project vicinity. The listed species are:

Common Name	Scientific Name	Federal Status
Indiana bat	*Myotis sodalis*	endangered
running buffalo clover	*Trifolium stoloniferum*	endangered

Indiana bat

Summer roost and/or winter habitat for the endangered Indiana bat may exist within the proposed project site. Based on this information, we believe that: (1) forested areas in the vicinity of and on the project area may provide potentially suitable summer roosting and foraging habitat for the Indiana bat; and (2) caves, rockshelters, and abandoned underground mines in the vicinity of and on the project area may provide potentially suitable wintering habitat for the Indiana bat. Our belief that potentially suitable habitat may be present is based on the information provided in your correspondence, the fact that much of the project site and/or surrounding areas contain forested habitats that are within the natural range of this species, and our knowledge of the life history characteristics of the species.

The Indiana bat utilizes a wide array of forested habitats, including riparian forests, bottomlands, and uplands for both summer foraging and roosting habitat. Indiana bats typically roost under exfoliating bark, in cavities of dead and live trees, and in snags (i.e., dead trees or dead portions of live trees). Trees in excess of 16 inches diameter at breast height (DBH) are considered optimal for maternity colony roosts, but trees in excess of 9 inches DBH appear to provide suitable maternity roosting habitat. Male Indiana bats have been observed roosting in trees as small as 5 inches DBH. By definition a "potential Indiana bat roost tree" is a tree that is greater than 5-inches DBH and exhibits one or more of the following characteristics: exfoliating bark, cracks, crevices, dead portions, and cavities.

Prior to hibernation, Indiana bats utilize the forest habitat around the hibernacula, where they feed and roost until temperatures drop to a point that forces them into hibernation. This "swarming" period is dependent upon weather conditions and may last from about September 15 to about November 15. This is a critical time for Indiana bats, since they are acquiring additional fat reserves and mating prior to hibernation. Research has shown that bats exhibiting this "swarming" behavior will range up to five miles from chosen hibernacula during this time. For hibernation, the Indiana bat prefers limestone caves, sandstone rockshelters, and abandoned underground mines with stable temperatures of 39 to 46 degrees F and humidity above 74 percent but below saturation.

Because we have concerns relating to the Indiana bat on this project and due to the lack of occurrence information available on this species relative to the proposed project area, we would have the following recommendations relative to Indiana bats.

- Based on the presence of numerous caves, rock shelters, and underground mines in Kentucky, we believe that it is reasonable to assume that other caves, rock shelters, and/or abandoned underground mines may occur within the project area, and, if they occur, they could provide winter habitat for Indiana bats. Therefore, we would recommend that the project proponent survey the project area for caves, rock shelters, and underground mines, identify any such habitats that may exist on-site, and avoid impacts to those sites pending an analysis of their suitability as Indiana bat habitat by this office.

- We would also recommend that the project proponent only remove trees within the project area between October 15 and March 31 in order to avoid potential direct impacts to summer roosting Indiana bats. However, if any Indiana bat hibernacula are identified on the project area, we recommend the project proponent only remove trees between November 15 and March 15 in order to avoid impacting Indiana bat "swarming" behavior. The resulting indirect and cumulative effects to Indiana bats from habitat removal are often determined to be insignificant and/or discountable; however, sometimes an indirect & cumulative effects analysis and/or other measures are necessary to ensure that the project is in full compliance with the ESA relative to the Indiana bat.

However, if these recommendations cannot be incorporated as project conditions, then the project area may be surveyed to determine the presence or absence of this species within the project area in an effort to determine if potential impacts to the Indiana bat are likely. A qualified biologist who holds the appropriate collection permits for the Indiana bat must undertake such surveys, and we would appreciate the opportunity to approve the biologist's survey plan prior to the survey being undertaken and to review all survey results, both positive and negative. If any Indiana bats are identified, we would request written notification of such occurrence(s) and further coordination and consultation.

If your project schedule requires the clearing of potential Indiana bat habitat (*i.e.*, trees) during the period of April 1 to October 14, you have two primary options for addressing impacts to Indiana bats. First, you can survey the project site as described previously, or you can enter into a Conservation Memorandum of Agreement (MOA) with the Service. By entering into a Conservation MOA with the Service, Cooperators gain flexibility in project timing with regard to the removal of suitable Indiana bat habitat. In exchange for this flexibility, the Cooperator provides recovery-focused conservation benefits to the Indiana bat through the implementation of minimization and mitigation measures as set forth in the Indiana Bat Mitigation Guidance for the Commonwealth of Kentucky. For additional information about this option, please notify our office.

Running buffalo clover

Running buffalo clover may occur within the proposed project site. This species requires periodic, moderate disturbances to reduce competition and maintain open or semi-open habitat conditions. Disturbed areas such as old pastures, moderately grazed fields, road rights-of-way, and power line rights-of-way that are mechanically maintained are known to provide suitable habitat for these species. Additionally, running buffalo clover is known to occur in habitats ranging from stream banks and low mesic (moderately moist) forests to lawns and cemeteries. If

the proposed project(s) require alteration of habitat that coincides with the habitat required for this species, an on-site inspection or survey of the area must be conducted to determine if the listed species is present or occurs seasonally. Prior to construction activities including tree clearing, a survey should be done by qualified personnel and be conducted during the appropriate time of day and/or year to ensure confidence in survey results. Please notify this office with the results of any surveys and an analysis of the "effects of the action," as defined by 50 CFR 402.02 on any listed species including consideration of direct, indirect, and cumulative effects.

A survey for running buffalo clover would not be necessary if sufficient site-specific information was available that showed that: (1) there is no potentially suitable habitat within the project area or its vicinity or (2) the species would not be present within the project area or its vicinity due to site-specific factors.

Thank you again for your request. Your concern for the protection of endangered and threatened species is greatly appreciated. If you have any questions regarding the information that we have provided, please contact Jessi Miller at (502) 695-0468 extension 104.

Sincerely,

Virgil Lee Andrews, Jr.
Field Supervisor

KENTUCKY DEPARTMENT OF FISH & WILDLIFE RESOURCES
TOURISM, ARTS, AND HERITAGE CABINET

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Secretary

Dr. Jonathan W. Gassett
Commissioner

8 November 2012

James L. Hagerty, PE
Hagerty Consulting, LLC
P.O. Box 459
Goshen, KY 40026-0459

RE: Oldham County Environmental Authority (OCEA)
OCEA Regional Facility Plan

Dear Mr. Hagerty:

The Kentucky Department of Fish and Wildlife Resources (KDFWR) has received your request for information regarding the subject project. The Kentucky Fish and Wildlife Information System indicates no federally - threatened/endangered species are known to occur within the boundaries of the project site. State-listed species are known to occur within one mile of the project site, but the KDFWR does not anticipate impacts to these species are any associated critical habitat as a result of this project. Please be aware that our database system is a dynamic one that only represents our current knowledge of various species distributions.

KDFWR recommends that you contact the appropriate US Army Corps of Engineers office and the Kentucky Division of Water prior to any work within the waterways or wetland habitats of Kentucky. Additionally, KDFWR recommends the following for the portions of the project that have the potential to impact streams:

- Channel changes located within the project area should incorporate natural stream channel design.
- If culverts are used, the culvert should be designed to allow the passage of aquatic organisms.
- Culverts should be designed so that degradation upstream and downstream of the culvert does not occur.
- Development/excavation during low flow period to minimize disturbances.
- Proper placement of erosion control structures below highly disturbed areas to minimize entry of silt into area streams.
- Replanting of disturbed areas after construction, including stream banks, with native vegetation for soil stabilization and enhancement of fish and wildlife populations. We recommend a 100 foot forested buffer along each stream bank.
- Return all disturbed instream habitat to a stable condition upon completion of construction in the area.
- Preservation of any tree canopy overhanging any streams within the project area.

To minimize indirect impacts to aquatic resources, strict erosion control measures should be developed and implemented prior to any construction to minimize siltation into streams and storm water drainage systems

located within the project area. Such erosion control measures may include, but are not limited to silt fences, staked straw bales, brush barriers, sediment basins, and diversion ditches. Erosion control measures will need to be installed prior to construction and should be inspected and repaired regularly as needed.

I hope this information is helpful to you, and if you have questions or require additional information, please call me at (502) 564-7109 extension 4453.

Sincerely,

Dan Stoelb
Wildlife Biologist

Cc: Environmental Section File